2167 taxa. This is about the same number of taxa as may be found in one of the states of the United States.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. V

Harold N. Moldenke

VITEX Tourn.

Additional synonymy: Vitax Moldenke, Indic. Taxon. Ass. Sudam. Fitotax. 1 (2): 3, sphalm. 1941. Lagasca Née ex Moldenke, Alph. List Invalid Names Suppl. 1: 11, in syn. 1947 [not Lagasca Cav., 1803].

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Additional excluded species: Vitex grandiflora Turcz. = Arrabidaea candicans (Rich.) DC.

VITEX ACUMINATA R. Br.

Additional citations: AUSTRALIA: Queensland: A. Cunningham 256 (N, N).

VITEX AGELAEIFOLIA Mildbr.

This species, as accepted by Pieper in 1928, is not the same as the Vitex agelaeifolia Mildbr., Wiss. Ergebn. Zent. Afr. Exped. 1910/11, 2: 80, hyponym (1922). The latter is apparently a synonym of V. phaseolifolia Mildbr.

VITEX AGNUS-CASTUS L.

Additional literature: P. Henderson, Handb. Pl., new ed., 482. 1910; Russell, Dean, & Vaughan, Webster's Imperial Dict. 1378. 1910--1911; Junell, Symb. Bot. Upsal. 4: 94. 1934; Moldenke, Phytologia 5: 161--176 & 186--189. 1955.

Additional synonymy: Vitex arguacustos L., in herb.

The economic uses enumerated in these notes under V. negundo apply also to the present species. An additional common name recorded for the species is "Narrow-leaved Purple Chaste-tree".

Additional citations: CULTIVATED: Argentina: Ruiz Leal 13913 (Z).

VITEX AGNUS-CASTUS f. ALBA (West.) Rehd.

An additional common name recorded for this form is "Narrow-leaved White Chaste-tree".

VITEX AGNUS-CASTUS f. LATIFOLIA (Mill.) Rehd.

Additional common names for this form are "Broad-leaved Purple Chaste-tree" (for the purple-flowered type) and "Broad-leaved White Chaste-tree" (for the white-flowered type).

Additional citations: CULTIVATED: New York: H. N. Moldenke 21251 (Z).

VITEX AJUGAEFLORA Dop

Additional literature: Dop, Trav. Lab. For. Toulouse 1 (1): pl. 4. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 196--197. 1955.

Illustrations: Dop, Trav. Lab. For. Toulouse 1 (1): pl. 4. 1928.

VITEX ALTISSIMA L. f.

Additional literature: The references given by me in Phytologia 5: 200--201 (1955) under "Vitex altissima var. alata" should be transferred here, and add: Wall., Numer. List [48], nos. 1752 & 1755. 1829; Jacks., Ind. Kew. 2: 1213. 1895; Bakh. & Lam, Bull. Jard. Bot. Buitenz., ser. 3, 4 (2): 285. 1922; Henninger, 1956 Price List [9]. 1955; Moldenke, Phytologia 5: 197--202. 1955.

Additional synonymy: The synonyms listed by me in Phytologia 5: 201 (1955) under "Vitex altissima var. alata" should be transferred here.

Santapau informs me that the specimens with broadly alate petioles, hitherto regarded as representing a variety of this species, actually are always from immature trees or from non-flowering branches of mature trees. On his collections no. 18604, 18605, and 18606, cited below -- all of which exhibit non-alate petioles -- he states "Tree ca. 30 ft. high; flrs. very similar in colour and structure to V. negundo; lower leaves with winged petiole, etc. as No. 18577; higher ones simply trifoliate." This observation has confirmed a long-standing suspicion of my own to the same effect. Practically all flowering specimens I have seen have had non-alate or practically non-alate petioles, while the specimens with very broadly alate petioles seldom, if ever, included flowering branchlets. For instance, Hallberg & McCann 34407, 34403, and 34424, Blatter 23419, Santapau 17735 and 18577, Herb. Hort. Bot. Bogor. IV.A.64, XI.K.7, XI.K.7a, and XII.B.VI.23, König 77, Royen 87, and Voigt s.n., all have alate petioles and all are sterile (flowerless). On the other hand, Santapau 18604, 18605, 18606, 18633, 18639, Blatter 23399, J. Fernandez 1245 and s.n., Acland 976, J. Hernandez 2453, and the specimens cited on page 200 under "Vitex altissima", almost all are in anthesis or fruit and show non-alate petioles. The Wight s.n. specimen at New York exhibits an inflorescence and also alate leaves, but the leaves are detached from the inflorescence-bearing branchlet and may well have been collected from a lower part of the tree. The Herb. Hort. Bot. Bogor. XI.K.7, XI.K.7a, and XII.B.VI.28 collections all show extraordinarily large leaves, with 5, 6, and 7 leaflets respectively, and were probably taken from very young trees or from vigorous shoots.

Rev. Santapau also points out that IF the variety were to be accepted as valid, the correct accredition of the trinomial would be "(Heyne) Trimen" and not "(Willd.) Moldenke" as stated by me in Phytologia 5: 200 (1955), since the latter is clearly a later homonym and is therefore invalid under the present Article 74 of the International Rules of Nomenclature.

The binomial "Vitex trifolia L." dated "1753" by me on page 197 of the above-mentioned work should actually be dated "1731".

Santapau has collected the species in open forests and in evergreen forests in Bombay, flowering and fruiting in May. Fernandez found it flowering in March and April. Santapau comments that it is a large shrub or small tree by roadsides (in leaf only, so doubtless immature) and that it is common on higher

ground near roadsides. Vidal found it flowering in March in Laos and reports the common name "khi hén".

Additional citations: The specimens cited by me in Phytologia 5: 202 (1955) under "Vitex altissima var. alata" should be transferred here. To them should be added: INDIA: Bombay: Acland 276 (Xa); Blatter 23419 (Xa), 23899 (Xa); J. Fernandez 130 (Xa), 1245 (Xa), 2453 (Xa), s.n. [March 1949] (Xa); Hallberg & McCann 34407 (Xa), 34408 (Xa), 34424 (Xa); Santapau 17735 (Xa), 18577 (Xa), 18604 (Xa), 18605 (Xa), 18606 (Xa), 18638 (Xa), 18639 (Xa). INDOCHINA: Laos: Vidal 2397 (Z).

VITEX AMBONIENSIS Gürke

Additional literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 63, & 81, pl. 11. 1928; Moldenke, Phytologia 5: 204--206. 1955.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11. 1928.

VITEX ANGOLENSIS Gürke

The Baum 298 collection cited by Pieper as this species is cited by Gürke in Baum, Kunene-Sambesi Exped. 350 (1903), apparently erroneously, as V. mechowii Gürke.

VITEX BARBATA Planch.

Additional literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 48, 61, & 81, pl. 10. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 209. 1955.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10. 1928.

VITEX BENTHAMIANA Domin

Additional literature: Domin, Bibl. Bot. 22 (89-6): 1114 & 1117, fig.182. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 210--211. 1955.

VITEX BEQUAERTI DeWild.

Additional literature: DeWild., Contrib. Fl. Katanga 164. 1921; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 60. 1928; DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 101 & 104. 1929; Moldenke, Phytologia 5: 211. 1955.

DeWildeman cites Quarré 1036 from Ferme Granat and says that the plant is a shrub 3--5 meters tall, growing on termitaria. He says that it is very closely related to V. giorgii DeWild., differing in the pubescence on the lower leaf-surfaces.

VITEX BOJERI Schau.

Additional literature: Ettingsh., K. Akad. Wiss. Wien Denkschr. 23: 219 [Fossile Flora Bilin 2: 32]. 1863; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 75, 78, & 81, pl. 9. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 215. 1955.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 9. 1928.

Additional synonymy: Vitex boyeri Schau. ex Ettingsh., K. Akad. Wiss. Wien. Denkschr. 23: 219 [Fossile Flora Bilin 2: 32], sphalm. 1863.

VITEX BUCHNERI Gürke

Additional literature: DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 107 & 109. 1929; Moldenke, Phytologia 5: 221--222. 1955.

DeWildeman states that this species is closely related to V. thomasi DeWild. and its variety kasaiensis DeWild.

VITEX CALOTHYRSA Sandw.

Additional literature: Ducke & Black, Bol. Téc. Inst. Agron. Norte 29: 24. 1954; Moldenke, Phytologia 5: 223--224 & 259. 1955.

VITEX CANESCENS Kurz

Vidal records the additional vernacular name "sa nga" from Laos.

Additional citations: INDOCHINA: Laos: Vidal 2031 (Z).

VITEX CAPITATA Vahl

Additional synonymy: Vitex bignonioides Kunth ex Ettingsh., K. Akad. Wiss. Wien Denkschr. 23: 219 [Fossile Fl. Bilin 2: 31]. 1863.

VITEX CHRYSOCARPA Planch.

Chevalier cites his nos. 2754, 2756, 2765, 2763, 24394, and s.n. from French Soudan.

VITEX CILIATA Pierre

Additional literature: Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 272. 1955.

VITEX COCHINCHINENSIS Dop

Additional literature: Dop, Trav. Lab. For. Toulouse 1 (1): pl. 3. 1923; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 274. 1955.

VITEX COFASSUS Reinw.

Additional synonymy: Vitex punctata DC. ex Ettingsh., K. Akad. Wiss. Wien Denkschr. 23: 219 [Fossile Flora Bilin 2: 31]. 1863. Vitex cofassus typica H. J. Lam ex Worsdell, Ind. Lond. Suppl. 2: 500. 1941.

Additional literature: Ettingsh., K. Akad. Wiss. Wien Denkschr. 23: 219 [Fossile Flora Bilin 2: 31]. 1863; Bakh. f. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 235. 1922; Kanehira, Fl. Micrones. 344. 1933; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 274--279. 1955.

Illustrations: Kanehira, Fl. Micrones. 344. 1933.

VITEX CONGOLENSIS DeWild. & Th. Dur.

DeWildeman cites also De Giorgi 486 and 507, Boone 17, Ghesquière s.n., and Vanderyst 9866, 10009, and 10078 from the Belgian Congo and records the additional vernacular names "aanion", "konguluneme", "lifangelu", and "mundjuga". De Giorgi states that "bois pour la fabrication des gongs", "perches pour construction", and "grosses racines pour fabriquer des chaises".

VITEX CUSPIDATA Hiern

In Phytologia 5: 307 (1955) I cite DeWild., Plant. Bequaert. 5: 9--10 as "1932". It should be dated "1929". The dates of publication of the parts of this volume are as follows: pp. 1--160 (October 1929), pp. 161--240 (February 1931), pp. 241--352 (July 1931), pp. 353--476 (May 1932), and pp. i--xiii & 477--496 (December 1932).

DeWildeman observes "M. Pieper fait observer avec raison qu'il est difficile, dans les conditions actuelles, de savoir exactement cequ'il en est de cette espèce. Nous sommes de son avis d'autant plus que nous n'avons peu comparer des documents que nous possèdons, et qui ont été déterminés par le Dr. Guerke lui-même, avex le type de l'Angola. Nous doutons cependant un peu du rapprochement des plantes de Dupuis du groupe 'Elongatae' car les calices florifères peu après la chute à la corolle ne montrent pas le caractère: 'Blüten mit grosses meistregelmässiger Kelkzähnen" ni "Frucht oft mit Stachelspitze". Dans la plante du Mayombe le calice mesure à peine 1,5 mm. de long, les dents à peine 0,5 mm., donc relativement peu visible."

VITEX CYMOSA Bert.

Additional literature: Angely, Gazeta do Povo, Curitiba, 37: no. 10698, p. 5. December 3, 1955; Moldenke, Phytologia 5: 307--313. 1955.

Additional citations: COLOMBIA: Magdalena: Romero Castañeda 1029 (Z). BRAZIL: Maranhao: Murça Pires & Black 1532a (M). Minas Gerais: Macedo 2529 (M). Pará: Murça Pires & Silva 1233 (Z).

VITEX DIVARICATA Sw.

Additional literature: Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 315--319. 1955.

Illustrations: R. C. Marshall, Trees Trin. & Tob. 77. 1934.

VITEX DONIANA Sweet

Additional literature: R. L. Yates, Journ. Roy. Hort. Soc. Lond. 46: 337. 1921; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 235. 1922; Lely, Useful Trees N. Nigeria 115. 1925; Crowfoot, Flow. Pl. N. & Cent. Sudan pl. 118. 1928; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 52, 64, 71--72, & 82, pl. 11. 1928; DeWild., Plant. Bequaert. 5: 8--9. 1929; DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 101--103. 1929; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 277. 1931; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Phytologia 5: 322--326. 1955.

Illustrations: R. L. Yates, Journ. Roy. Hort. Soc. Lond. 46: 337. 1921; Lely, Useful Trees N. Nigeria 115. 1925; Crowfoot, Flow. Pl. N. & Cent. Sudan pl. 148. 1928; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 11. 1928; Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 277. 1931.

Quarré collected this species in flower in August. The V. divaricata Baker said by me in my Prelim. Alph. List Invalid Names 50 (1940) to belong in the synonymy of V. doniana actually is a synonym of V. milnei Pieper. In Phytologia 5: 322 (1955) I cite De Wild., Plant. Bequaert. 5: 8--9 as having been published in "1932". These pages of that volume were actually issued in 1929.

V. doniana is said by collectors to be a tree 7--20 meters tall, with a trunk 3--10 meters tall and 20--80 cm. in diameter; bark brownish-black or gray, friable, fissured, easily exfoliating; leaf-scars conspicuous; terminal buds large, brown, spherical, about 4 mm. long and 3 mm. wide, pubescent; branches cylindric or quadrangular, gray or brownish, spotted with pinkish-white when fresh; twigs quadrangular, brownish-black, spotted with black and brown, pale-green toward the tips; petioles to 20 cm. long, brown or green spotted with brown, compressed, canaliculate above, short-pubescent beneath; leaflet-blades short-pubescent beneath, shiny above, sinuate-margined; secondaries issuing at angles of 45--70°; calyx gray-brown; corolla with 4 petals brownish on the exterior and white on the interior and the fifth petal bluish.

It is said to grow on gray-black sand and on laterite, at 1200 meters altitude. Robyns states that it grows in gallery forests, is myrmecophilous, and "bon bois de chauffage". Bequaert found it on herbaceous savannas. Its wood is used by the natives to make tomtoms.

Chevalier cites his nos. 2757 and 2758 from the Casamance region of Senegal, his nos. 12866 and 14729 (the latter actually collected by Caille) from French Guinea, and his nos. 1646, 2766, 2769, and two s.n. collections from French Soudan. He says that it attains a height of 17 meters and has yellowish corollas. De Wildeman cites Bequaert 62, 1425, 4806, and 7948, Blommaert 139, Claessens s.n., Delevoy 113, 139, 252, 366, and 449, Dewevre 179, M. Laurent 1912, Laurent & Laurent s.n., Ritschard 1512, Sapin s.n., Thomas 1327, Vandermeiren s.n., Vanderyst 14589 and two s.n. collections, and Verschueren XV from Belgian Congo. He also records the additional vernacular names "bilikita", "furongo" "mufuta", "mufutu", and "mukunke". The name "mufutu", however, is a group name, applied to 3 or 4 different kinds of trees.

Specimens of this plant have been misidentified in herbaria as V. ringoeti De Wild., a synonym of V. madiensis var. milanjiensis (Britten) Pieper.

Additional citations: BELGIAN CONGO: Quarré 2651 (Br, Br, Br, Br, Br).

VITEX DUCKEI Huber

Additional citations: BRAZIL: Pará: Murça Pires & Silva 4400

(N).

VITEX FLAVENS H.B.K.

Additional literature: Hook. & Arn., Bot. Beechey Voy. 1: 305. 1838; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 22: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 62, 70, 74, 95, & 201. 1949; Ducke & Black, Bol. Téc. Inst. Agron. Norte 29: 38. 1954.

Illustrations: Huber, Bol. Mus. Goeldi [Mus. Para.] 5: pl. 4. 1908.

Shrub or tree, to 20 m. tall; branches tetragonal; branchlets rather stout, obtusely tetragonal, gray or brownish, flavescent-tomentose or densely puberulent with brownish hairs, becoming more sparsely so or even glabrate in age, not noticeably lenticellate; twigs slender, rather short, tetragonal or compressed-flattened, densely short-pubescent or puberulent with flavescent or fulvous hairs; nodes not annulate (or slightly annulate with a denser line of pubescence on young twigs); principal internodes 1--6.5 cm. long; leaf-scars very large and corky, often greatly elevated on the branchlets; leaves decussate-opposite, 5-foliolate, very immature at time of anthesis; petioles slender, 2--12 cm. long, convex beneath, flattened and canaliculate or sulcate above, densely short-pubescent with flavescent or fulvous pubescence, very slightly ampliate at the base, club-shaped at the apex; leaflets subequal or the two lowermost somewhat smaller than the central ones, all sessile or subsessile when immature but petiolulate when mature; petiolules slender, deeply canaliculate, 2--12 mm. long, densely short-pubescent or velutinous-tomentellous with flavescent or fulvous hairs; leaflet-blades membranous, very dark-green above (brunnescent or nigrescent in drying), flavescent or fulvous beneath, the central one oblong or lanceolate-oblong, varying to narrow-elliptic, 4--10 cm. long, 1.5--3.7 cm. wide, acute or short-acuminate at the apex (rarely obtuse), entire, acute at the base, rather lightly appressed-pubescent throughout above, very densely and softly short-pubescent or velutinous-tomentellous beneath, the pubescence decidedly flavescent or fulvous, the lateral ones similar in all respects except often smaller and less acuminate; midrib slender, flat above, prominent beneath; secondaries slender, 10--20 per side, arcuate-ascending, flat above, prominulent beneath, arcuately joined at the margins beneath; vein and veinlet reticulation sparse, obscure or indiscernible above, usually hidden by the pubescence beneath or the larger portions conspicuous by not being as pubescent as the lamina; inflorescence axillary, cymose, 3--8 cm. long, 1.5--4.5 cm. wide, usually half as long as the subtending petiole, often corymbiform, 1 to 4 times dichotomous, usually densely many-flowered, canescent- or flavescent-puberulent or short-pubescent throughout; peduncles slender, 0.7--4.5 cm. long, flattened, rather densely puberulent or short-pubescent or even tomentose, slightly ampliate at the apex and annulate with a band of denser pubescence; cyme-branches flattened, pubes-

cent and annulate like the peduncles; pedicels varying from obsolete on lateral flowers to 6 mm. long on central ones; bractlets oblong, spatulate, or linear, 3--6 mm. long, sessile; prophylla linear or setaceous, about 1 mm. long, densely short-pubescent; calyx campanulate, 2--3.5 mm. long and wide, densely appressed-pubescent with short flavescent antrorse hairs, its rim rather deeply 5-dentate, the teeth ovate-triangular, acute or blunt at the apex, often recurved or reflexed, brunnescent on the inner surface; corolla hypocrateriform, varying from purple or lilac to blue, lavender-blue, or blue-violet, its tube broadly cylindric, about 5 mm. long, densely short-pubescent on the outside, its limb 2-lipped, the 4 small lobes 2--3 mm. long and obtuse, the lower lip greatly enlarged, lingulate, 6--7 mm. long, crisped along the rounded margin; stamens and style exserted about 5 mm. from the corolla-mouth; fruiting-calyx cupuliform, about 4 mm. long and 5 mm. wide, its rim deeply triangular-toothed; drupes fleshy, subglobose, about 5 mm. long and wide.

The type of this rather widespread species was collected by Humboldt and Bonpland [Herb. Willdenow 11710] probably somewhere in Peru. The type of V. rusbyi was collected by Henry Hurd Rusby and Francis Whittier Pennell (no. 1143) in a light forest on a rocky hill at a gorge, altitude 450 to 550 meters, Natagaima, Huila, Colombia, on August 12, 1917. The species apparently inhabits a vast area from Colombia, Ecuador, and Peru to Amazonian Brazil. A Barclay specimen at Kew is labeled "Central America" and may be from Panama. It has been collected in anthesis in March, May, July, September, and October, ascending to 550 meters altitude in Colombia. It inhabits hilly land, light forests, especially rocky hills, bluffs, gorges, damp ground in quebradas, and streamsides, often in loam soil. The wood is used in the construction of houses in Ecuador, where it is considered excellent for this purpose. It has been confused with the very similar V. cymosa Bert. and V. gigantea H.B.K., as well as with the unrelated V. schomburgkiana Schau. and "V. montevidensis Cham." Kunth in his original description says that it is related to V. rufescens A. L. Juss. and "V. ferruginea Vahl". Pavon designated it as "Leucoxylon" and as "Vitex sp. nov.", and the printed labels on his collection say "Nueva España", probably in error. It is called "taruman" and "taruman tuira" in Brazil according to Huber, "acietuno" in Colombia, and "pechiche" in Ecuador. Ducke calls it "tarumá" and "mameira". Le Cointe in his 1945 publication, cited above, records the names "taruman-tuira", "tarumá-tuira", and "tarumá grande do campo", while in his 1934 work he records "taruma grande do campo", "mammeira", and "tarumá tuira"

Ducke in his 1932 publication says that on the campos of the lower Amazon where V. triflora Vahl and V. flavens grow side by side one often finds specimens that seem to be hybrids between the two, with intermediate characters. Specimens so labeled and seen by me have proved to be V. triflora var. kraatzii Huber.

The date of publication of the binomial here accepted for this species is often given in books as "1817" or "1819", but

was actually 1818 according to Barnhart in the reference cited above.

Citations: COLOMBIA: Cundinamarca: Goudot s.n. [Santa Fé de Bogotá] (Cb). Huila: H. L. Mason 13840 (W--2047916); Rusby & Pennell 221 (G, N), 1143 (G, N, W--1041627); S. G. Smith 1251 (Ca--963210, W--2047572). Magdalena: Goudot s.n. [vallée de la Magdalein] (K, P). Tolima: Goudot s.n. [Ibagué] (K, P). ECUADOR: Esmeraldas: Lehmann 7647 (B, F--578234, K); Rose & Rose 23488 (G, N, W--1022980). Guayas: André 4155 (K, K, K, N); Barclay 2469 (Bm); Eggers 14524 (B, B); Mille 19 (W--1420112); Preuss 1941 (B, B); Schimpff 353 (B, B, Cb, E--1081683); Sinclair s.n. [Guayaquil] (K, K, K, N), s.n. [Puna] (K); Spruce s.n. [Guayaquil] (K). Los Ríos: Schimpff 325 (B, B, Cb, E--1087720). Province undetermined: André 1942 (K, N); Eggers 15302 (F--143079). PERU: Loreto: Tessmann 3247 (B, Cb, S), 4492 (B, B, Cb), 4587 (B). Province undetermined: Humboldt & Bonpland s.n. [Herb. Willdenow 11710; Macbride photos 39494] (F--1038373--photo of type, Kr--photo of type, N--photo of type. N--photo of type, P--type, Z--photo of type); Pavon s.n. [Nueva España] (Cb, E--photo, N--photo, Z--photo). BRAZIL: Amazonas: Ule 6163 (B, Cb, K, Le). Maranhão: Lisboa 2473 (Bm, Cb, P, W--1040300). Pará: Ducke 3699 (Cb, Cb); Huber 1630 (Cb). State undetermined: Collector undesignated s.n. [Brazil] (P, P). LOCALITY OF COLLECTION UNDETERMINED: Barclay s.n. [Central America] (K).

VITEX FLORIDULA Duchass. & Walp. in Walp., Ann. Bot. Syst. 3: 240. 1852.

Literature: Walp., Ann. Bot. Syst. 3: 240. 1852; Moldenke, Geogr. Distrib. Avicenn. 18. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 24 & 103 (1942) and [ed. 2], 41 & 201. 1949.

Tree, to 20 m. tall; trunk rough, shaggy; wood very hard; crown low, rounded; branches and branchlets medium-slender, light-gray or whitish, obtusely tetragonal, minutely puberulent, becoming glabrate in age, rather corky, densely lenticellate; twigs short, more densely puberulent with grayish hairs; nodes not annulate, usually not ampliate nor flattened; principal internodes to 11 cm. long, usually abbreviated to less than 1 cm. on the branchlets and twigs; leaves decussate-opposite, developed after the flowers, 3-foliolate; petioles slender, 2.5--7 cm. long, flattened above but not canaliculate nor margined, slightly ampliate at the base, very minutely and obscurely puberulent or glabrate; petiolules slender, 5--11 mm. long, canaliculate-margined, very minutely puberulent, the central one more elongate than the lateral ones; leaflet-blades firmly chartaceous and rather thick when mature, very nitidous on both surfaces, dark-green above, bright-green beneath, elliptic, 4--14.8 cm. long, 2.2--8 cm. wide, acute or short-acuminate at the apex, entire, usually slightly subrevolute along the margins when mature, glabrous or glabrate on both surfaces, the lateral ones exactly

similar to the central one only smaller; midrib deeply impressed above (on mature leaves), prominent beneath; secondaries slender, 8—15 per side, arcuate-ascending, rather deeply impressed above, prominulent beneath, indistinctly arcuate-joined near the margin; vein and veinlet reticulation delicate, rather abundant, obscure or indiscernible above, plane beneath; inflorescence axillary, developed before the leaves; corolla purple or light-violet.

The type of this species is a Duchassaing collection from Panama. Hayes describes the species as "a large verbenaceous tree 50--60 feet high, with rough shaggy trunk of very hard wood and naked of leaves". A wood sample is seen on Pittier 3477 at Kew and in the United States National Herbarium. Pittier calls it a small tree with a low rounded crown. It grows in forests on dry limestone soil and along rivers, ascending from sea-level to 100 meters altitude, blooming in April and May. It has been collected in leaf in October (Pittier 4683). It has been misidentified as V. masoniana Pittier. The Paul 28 distributed as V. floridula is actually Godmania aesculifolia (H.B.K.) Standl., while the Chickering 59, also so distributed, is Arrabidaea florida P. DC., both in the Bignoniaceae.

Citations: PANAMA: Canal Zone: Christopherson 153 (W--716472); Hayes 15 (Ed), s.n. [March 20, 1861] (K); G. Haynes 464 (N, N); D. Jones 325 (W--1686111, W--1686112); Mason 10 (N--photo, W--716041, Z--photo); P. White 89 (N). Panamá: P. H. Allen 959 (E--1121187, N, S); Pittier 3477 (A, Bm, Cp, F--468401, F--506337, G, K, N, W--678522, W--678523), 4683 (G, N, N--photo, W--679843, Z--photo), 6585 (N, W--716650), 6604 (E--883828, F--506354, G, W--716667), 6626 (Bm, G, N, W--716693).

VITEX FOSTERI C. H. Wright, Kew Bull. 1908: 437. 1908.

Literature: C. H. Wright, Kew Bull. 1908: 437. 1908; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 68, & 81, pl. 10. 1928; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46, 47, & 103. 1942; Moldenke, Phytologia 2: 119. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111--113 & 201. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10. 1928.

Leaves 5--7-foliolate; leaflet-blades short-acuminate, partially dentate, glabrous above; calyx-teeth mostly regular, 2.5--3 mm. long; corolla with large downwardly bent lobes when mature and deeply split upper lip; ovary broadly elliptic, hairy and often also glanduliferous, but the glands hidden by the erect pubescence; fruit often spine-tipped.

Pieper cites Foster 34 from Lagos, Nigeria, and Thompson 37 from Gold Coast. Common names recorded for the species are "akwakora-gyahini", "ibang", "koro koronta", "obuban", "ogi", and "ŏrì-ĕtà".

Citations: GUINEA: Thonning 265 (Cp, N--photo, Z--photo).

VITEX FROESII Moldenke, Phytologia 1: 485--486. 1941.

Literature: Moldenke, Phytologia 1: 485--486. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 103. 1942; Moldenke, Phytologia 2: 119. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 201. 1949.

Tree, to 15 m. tall; trunk to 13 cm. in diameter; branchlets medium-stout, gray, obtusely tetragonal, glabrescent; young twigs stout, obtusely tetragonal, very densely villous-tomentose with long fulvous hairs; buds densely long-villous; nodes somewhat enlarged and ampliate, not annulate; principal internodes 2.5--8 cm. long; leaves decussate-opposite, 3-foliolate; petioles stout, 4.5--11 cm. long, very densely villous-tomentose with fulvous hairs similar to those on the twigs; petiolules absent; leaflet-blades subcoriaceous, sessile, broadly elliptic or obovate, lighter beneath, the central one 8--13.5 cm. long, 5--12.3 cm. wide, rounded or very slightly cuspidate at the apex, entire, slightly undulate or sinuate, cuneate and symmetrical at the base, densely villous-velutinous on both surfaces, more conspicuously so beneath, with flavescent hairs; midrib stoutish, prominulous (except toward the apex) above, very prominent beneath; secondaries slender, 10--15 per side, ascending, not much arcuate (except toward the margins), close together, joined in many loops at the margins, very slightly impressed above, prominent beneath; veinlet reticulation abundant, slightly impressed above, prominulous beneath; lateral leaflets similar, practically the same size as the central one or slightly smaller, but usually asymmetric at the base or asymmetric throughout, often rounded or subtruncate at the base, or the outer half broadly rounded and the inner half cuneate at the base; inflorescence glomerate, sessile, bracteose, very densely long-villous with fulvous hairs; bracts numerous, lanceolate, 1.8--2.3 cm. long and 2--5 mm. wide at the base, sessile, densely villous on the outer surface, concave from within, an opposite pair closely appressed to the base of the calyx and alternate with its lips; calyx tubular, about 1.8 cm. long and 5 mm. wide, distinctly 2-lipped, one lip 2-lobed at the apex, the other lip 3-lobed, the lobes 1--3 mm. long, slender, triangular-acuminate, the sinuses between the lips about 5 mm. deep, in fruit greatly enlarged and splitting to the base, the 2 halves broadly ovate-elliptic, to 2.5 cm. long and 1.7 cm. wide, the lobes 5--7 mm. long; corolla and fruit not known.

The type of this most remarkable species was collected by Ricardo de Lemos Fróes (no. 11660) on high land in a high forest on terra firma along the Rio Pindare, Rapoza Monção, Maranhão, Brazil, on December 15, 1937. He states that a vernacular name for the plant is "taruma da mata". It is known only from the original collection.

Citations: BRAZIL: Maranhão: Fróes 11660 (N--isotype, N--isotype, N--type).

VITEX GABUNENSIS Gürke in Engl., Bot. Jahrb. 18: 167. 1894.

Literature: Gürke in Engl., Bot. Jahrb. 18: 167. 1894; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 327. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, & 81. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 103 (1942) and [ed. 2], 114 & 201. 1949.

Shrub, 1--1.3 m. tall; branchlets glabrous; leaves opposite, 5-foliolate; leaflet-blades moderately firm, distinctly stalked, oblong-cuneate, green and glabrous on both surfaces, entire, the central one 20--22.5 cm. long and less than half as wide; cymes sparse, short-pedunculate; bracts often reduced; calyx cyathiform, gradually attenuate into the pedicel at base, its pubescence appressed, glabrous within; corolla over 8 mm. long, its tube longer than 1 1/2 times the calyx length, the tip of the upper lip 1/5 to 1/3 the length of the tube; fruit globose, the size of a large pea; fruiting-calyx about 7 mm. in diameter, its rim subentire.

The type of this species, and the only known collection, is Soyaux 163 from Sibange Farm, Munda, Gabun, in French Equatorial Africa.

VITEX GAMOSEPALA Griff., Notul. 4: 178. 1851.

Synonymy: Vitex gamosepala var. typica H. J. Lam, Verbenac. Malay. Arch. 210. 1919. Vitex glossocalyx H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 3: 59, in not. 1921.

Literature: Griff., Notul. 4: 178. 1851; Griff., Ic. Pl. Asiat. pl. 448, fig. 2. 1854; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 538. 1885; King & Gamble, Mat. Fl. Malay Penins. 855--857. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 855--856. 1909; H. J. Lam, Verbenac. Malay. Arch. 209--211 & 369. 1919; Ridl., Fl. Mal. Penins. 635--636. 1923; Fletcher, Kew Bull. 1938: 436. 1938; Moldenke, Suppl. List Common Names 6, 13, 17, 20, & 21. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 60, 61, & 103. 1942; Moldenke, Phytologia 2: 119. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 138--140 & 201. 1949.

Illustrations: Griff., Ic. Pl. Asiat. pl. 448, fig. 2. 1854.

Moderately sized tree, 4--8 m. tall, usually with many stems; bark smooth, grayish; branchlets more or less tetragonal, minutely pubescent and glandulose; leaves 3-foliolate; petioles 4.5--10 cm. long, minutely pubescent and glandulose; petiolules 0.3--2.5 cm. long, minutely pubescent and glandulose; leaflet-blades chartaceous, ovate or ovate-lanceolate, 9--17.5 cm. long, 4--6.5 cm. wide, acuminate at the apex, acute or attenuate at the base, entire, glabrous on both surfaces except for the pubescent midrib, glandulose beneath, the lateral ones smaller in all respects; secondaries 5--7; cymes axillary, short-pedunculate, dichotomous, 1.3--4 cm. long and wide; peduncles 2--10 mm. long; calyx-tube 2.5--3 mm. long, 2-lipped, the upper lip entire, 4 mm. long, the lower lip deeply bifid, 2--2.5 mm. long, glabrous and very densely yellow-glandular throughout; corolla-tube slender, 8--12 mm. long, glabrous and very densely glandular (except the lowest 1 mm.) on the outer surface, glabrous within except for a ring of stiff antrorse hairs at the middle, the upper lip entire or 2-

lobed, the lower lip 3-lobed; stamens inserted at about the middle of the corolla-tube; anthers reniform; ovary pubescent and glandulose; fruit drupaceous, globose, anout 4 mm. long and wide, glabrous, brown-lenticellate, green when young, black when mature.

This species is said to be common in deciduous forests on rocky ground, at altitudes of 50 meters, in Siam. Common names recorded for it are "cooked rice leban", "lĕban nasi", "lĕban pachat", "leech's lĕban", "mak lek mak noi", "pĕlong", "sĕtulang", and "sulong chong". Lam's variety typica is based on Griffith 6065 and Maingay 1202 from Malacca as cotypes -- the same collections as are cited for the species by Clarke. Kin & Gamble cite in addition Scortechini 445 & 1480 and Kunstler s.n. [King's Collector 1841] from Perak, Curtis 2366 and Ridley 8546, 10218, & 10479 from Selangor, and Ridley 2788 from Singapore.

Citations: THAILAND: Smitinand 1478 [Herb. Roy. Forest Dept. 6822] (Z). MALAYA: Malacca: Griffith 6065 (N, N--photo, S, Ut--11513, Z--photo).

VITEX GAMOSEPALA var. KUNSTLERI King & Gamble, Journ. As. Soc. Beng. 74: 856--857. 1909.

Synonymy: Vitex acuminata Korth. ex H. J. Lam, Verbenac. Malay. Arch. 369, in syn. 1919 [not V. acuminata R. Br., 1810]. Vitex neglecta var. glabrior H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 60. 1921. Vitex vestita var. neglecta f. glabrior H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex vestita var. genuina f. glabrior Beumée, in herb.

Literature: King & Gamble, Mat. Fl. Malay Penins. 856--857. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 856. 1909; H. J. Lam, Verbenac. Malay. Arch. 210--211 & 369. 1919; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 60. 1921; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922; Rendle, Journ. Bot. 63: Suppl. 81. 1925; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63, 65, & 103 (1942) and [ed. 2], 143, 146, & 201. 1949.

This variety differs from the typical form of the species in having its petioles 2.5-5 cm. long, the leaflets 5--7.5 [--13?] cm. long and 2.5--4 cm. wide, the central petiolule about 1.3 cm. long and the lateral ones about 6 mm. long, the cymes about 1.3 cm. long and wide, the peduncles about 2 mm. long, the calyx about 2.5 mm. long, sparsely glandular and somewhat pubescent, the upper lip about 1.8 mm. long and entire or 2-lobed, the lower lip about 1.25 mm. long and bifid, and the corolla-tube about 1.2 cm. long, densely glandulose, the upper lip shortly 2-lobed.

The plant is said to be a shrub, small tree, or large tree, with yellow, orange, or bright-orange corollas, and brown fruit which becomes black in age.

Cotypes of the variety are King's Collector 10605 from Perak and Rostado s.n. [Ridley 11982] from Trengganu. The type of V. neglecta var. glabrior and the other polynomials based on it ap-

pears to be Jacobson 2675 in the Buitenzorg herbarium. The variety has in the past been misidentified in herbaria as V. gamosepala Griff and V. vestita Wall. Common names recorded for it are "kajoe giak batae", "kajoe golom lisak", "kajoe lisak", and "kajoe pat ni lisak". Forbes 2685 is cited for this variety by Lam and by Rendle, but the Vienna University sheet of this number, examined by me, is not even verbenaceous. A case of transposed labels may be involved here.

Lam cites in addition Junghuhn 520, Beccari 768, and Korthals s.n. [Herb. Lugd.-Bat. 908266-750] from Sumatra and Winkler 2433 from Borneo.

The variety has been collected in anthesis in March and June and in fruit in August, at altitudes of from 100 to 250 meters.

Citations: SUMATRA: H. H. Bartlett 6919 (N); Boeea 7155 (S), 7532 (S), 7821 (S), 7971 (S); Bünnemeijer 103 (Bz--25379, Bz--25677); H. O. Forbes 2771 (N, Vu); Jacobson 2675 (Bz--25382, N--photo, Z--photo); Posthumus 702 (Bz--25395, Bz--25396, Bz--97184), 988 [77] (Bz--25392, Bz--25393, Bz--25394); Toesin 8 [Boschbouwproefst. BB.8131] (Bz--25380); Wahab 3 [Boschbouwproefst. BB. 8110] (Bz--25381); Yates 1183 (Bz--2543, N), 2036 (Bz--24044, Bz--24045, N).

VITEX GAMOSEPALA var. SCORTECHINII King & Gamble, Journ. As. Soc. Beng. 74: 856. 1909.

Literature: King & Gamble, Mat. Fl. Malay Penins. 856. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 856. 1909; H. J. Lam, Verbenac. Malay. Arch. 210. 1919; Rendle, Journ. Bot. 63: Suppl. 81. 1925; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63 & 103 (1942) and [ed. 2], 143 & 201. 1949.

This variety differs from the typical form of the species in having its calyx 2 mm. long, less densely glandulose, the upper lip about 1.8 mm. long and entire, the lower lip about 0.65 mm. long and 2-toothed, the lobes acute, and the corolla somewhat pubescent and less densely glandulose.

The variety is based on Forbes 3060 from Sumatra, collected at an altitude of 600 feet. King & Gamble also cite Ridley 9725 and Wray 180, 992, and 1080 from Perak and Ridley 10096 from Negri Sembilan.

VITEX GARDNERIANA Schau. in A. DC., Prodr. 11: 687--688. 1847.

Synonymy: Vitex gardneriana Cham., in herb.

Literature: Schau. in A. DC., Prodr. 11: 687--688. 1847; Schau. in Mart., Fl. Bras. 9:296. 1851; Moldenke, Alph. List Common Names 16. 1939; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 103. 1942; Moldenke, Phytologia 2: 119. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 201. 1949.

Shrub or low spreading tree, to 4 m. tall, often broader than high; branchlets slender, obtusely tetragonal, gray, subglabrate;

twigs slender, rather elongate, gray-buff or brownish, obtusely tetragonal, densely short-pubescent throughout with grayish-canescent hairs, somewhat lenticellate; nodes annulate; principal internodes 0.7--6 cm. long, mostly elongate; leaves decussate-opposite, 1-foliolate, the joint in the petiole not obvious; petioles medium-slender, 12--15 mm. long, densely short-puberulent with canescent or sordid-brownish hairs, convex beneath, flattened and canaliculate above, very slightly ampliate at the base, not noticeably jointed; blades firmly chartaceous or subcoriaceous, light- or dark-green on both surfaces or somewhat lighter beneath when immature, shiny above when mature, varying from lanceolate or obovate-lanceolate to oblong-elliptic, 6.5--11.5 cm. long, 1.8--3.4 cm. wide, bluntly acute or obtuse at the apex, entire or obsoletely serrate, acute or obtuse at the base, sometimes slightly cuneately attenuate, very minutely and obscurely pulverulent-puberulent above (especially on the midrib), soon becoming glabrate and shiny, rather densely short-pubescent beneath with cinereous-canescent or sordid-brownish hairs, furfuraceous when young; midrib slender, rather deeply impressed above, very prominent beneath; secondaries slender, 8--11 per side, arcuate-ascending, flat or subimpressed above, very sharply prominent beneath, arcuately joined near the margins beneath; vein and veinlet reticulation abundant, flat or the larger parts subimpressed above, all parts conspicuously prominent beneath; inflorescence axillary, cymose, simple, rather sparse, 1.3--3.5 cm. long, 1--2.5 cm. wide, usually once or twice dichotomous, 3--7-flowered; peduncles slender, 1--1.5 cm. long, somewhat flattened, slightly ampliate above, densely pubescent with canescent or yellowish hairs, often annulate with a band of larger and denser hairs at the apex; cyme-branches similar; pedicels obsolete or 1--2 mm. long and densely pubescent like the peduncles and cyme-branches; bracts and bractlets oblong-linear or oblanceolate, stipitate, to 1 cm. long; prophylla linear, 1--3 mm. long, densely canescent-pubescent; calyx campanulate, about 4 mm. long and wide, densely white-pubescent, its rim 5-dentate, the teeth about 1 mm. long, ovate, spreading, rather acute at the apex; corolla violet, hypocrateriform, its tube cylindric, slightly ampliate at the apex, glabrous within the calyx, white-lanate or tomentellous toward the apex above the calyx, the limb pulverulent-puberulent within, densely white-lanate or tomentellous on the outer surface, the upper and lateral lobes smaller, ovate, about 4 mm. long and wide, obtuse, the large lower lip rotund, about 7 mm. long and wide, its margins undulate-crisped; fruiting calyx subpatelliform, 2--3 mm. long, about 9 mm. wide, white-tomentellous outside, its rim irregularly toothed; fruit drupaceous, oblong, about 10 mm. long and 8 mm. wide, nigrescent and hard in drying, glabrous, 2-sulcate toward the base.

This very distinctive species was based by Schauer on unnumbered G. Gardner and Houllet specimens from "circa Rio de Janeiro". It seems obvious, however, that the Gardner collections to which he refers are nos. 1107 and 1107bis which were collected in the state of Pernambuco, although the Conservatoire et Jardin Botan-

iques, Geneva, specimen is inscribed "mont. d'Organ". The New York Botanical Garden specimen bears a label reading "near Pernambuco". The Glaziou collections cited below bear labels in most herbaria reading "Rio de Janeiro", but were actually collected in the state of Espirito Santo according to Glaziou's own published report.

The species inhabits deserts of rock and sand, dry bushy, sandy, or rocky places, and the margins of streams, ascending to 300 meters altitude. It has been collected in anthesis from June to September and in November, and in fruit in August. Common names are "jaramataia" and "girimato". It has been confused with and distributed as Avicennia africana P. Beauv., Aegiphila sp., and even as the fern Nephrodium pohlianum Presl! Turczaninow states that Vitex erythrocarpa Salzm. is closely related to this species, but actually Salzmann's name is a synonym of Aegiphila lhotzkiana Cham.

Citations: BRAZIL: Alagoas: M. A. Chase 7808 (A, E--932723, F--568042, W--1232130). Ceará: Drouet 2389 (F--877984, F--948892, G, N, S); Ducke 989 (Bm, Cb, N, P, W--1040229), 1156 (Bm, P, W--1040230), 1323 [Herb. Gen. Mus. Para. 989] (B); Freire Allemão 1174 (Ja--5971), 1179 (Ja--5972), s.n. [Herb. Rio de Janeiro 31774] (N), s.n. (Ja--44808). Espirito Santo: Glaziou 11322, in part (K), 11323, in part (B, Cp, P). Parahyba: Pickel 3951 (N). Pernambuco: G. Gardner 1107 [Macbride photos 28400] (Bm--cotype, Bm--fruit of cotype, Cb--cotype, Ed--cotype, F--831263--photo of cotype, K--cotype, K--cotype, Kr--photo of cotype, N--cotype, N--photo of cotype, P--cotype, P--cotype, S--cotype, V--cotype, W--1066494--cotype), 1107bis (K--cotype). Rio de Janeiro: Moullet s.n. [along the Capibaribe, Moxoto, etc.] (Br--cotype).

VITEX GAUMERI Greenm., Field Mus. Publ. Bot. 2: 260--261. 1907.

Synonymy: Vitex pyramidata Millsp. apud Greenm., Field Mus. Publ. Bot. 2: 261, in syn. 1907 [not V. pyramidata B. L. Robinson, 1894]. Vitex longeracemosa Pittier, Contrib. U. S. Nat. Herb. 20: 486. 1922. Pekea pedunculata Schott ex Moldenke, Prelim. Alph. List Invalid Names 33, in syn. 1940. Vitex gaumerii Greenm. ex Moldenke, Prelim. Alph. List Invalid Names 50, in syn. 1940.

Literature: Millsp., Publ. Field Mus. Bot. 1: 317. 1896; Greenm., Publ. Field Mus. Bot. 2: 260--261. 1907; Pittier, Contrib. U. S. Nat. Herb. 20: 486. 1922; Record & Mell, Timbers Trop. Am. 526--527. 1924; Standl., Publ. Field Mus. Bot. 3: 404. 1930; Junell, Symb. Bot. Upsal. 4: 93--95, fig. 142 a & b. 1934; Lundell, Carnegie Inst. Wash. Publ. 478: 38, 39, 75, 96, 136, 143, 183, 191--194, & 203. 1937; Moldenke, Alph. List Common Names 4, 5, 10, 12, 17, 19, 21, 22, & 33. 1939; Moldenke, Geogr. Distrib. Avicenn. 14--16. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 208--210. 1940; Yuncker, Publ. Field Mus. Bot. 9 (4): 330. 1940; Moldenke, Suppl. List Common Names 24. 1940; Moldenke, Prelim. Alph. List Invalid Names 33 & 50--52. 1940; Contrib.

Univ. Mich. Herb. 8: 61. 1942; Lundell, Chron. Bot. 7: 170. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19--21 & 103. 1942; Moldenke, Alph. List Invalid Names 34 & 53--55. 1942; Egler, Caribb. Forest. 5: 14. 1943; Moldenke, Phytologia 2: 119. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33, 36, 37, & 201. 1949; Matuda, Am. Midl. Nat. 44: 576. 1950.

Illustrations: Junell, Symb. Bot. Upsal. 4: fig. 142 a & b. 1934.

Shrub or large tree, 7--30 m. tall; trunk to 60 cm. in diameter; crown spreading; branches and branchlets very stout and heavy, very medullose, obtusely tetragonal, often sulcate, gray or almost white, densely short-pubescent or puberulent with grayish hairs (rarely becoming glabrate); twigs densely short-pubescent or puberulent with grayish, albidous, or flavescent hairs; nodes mostly distinctly annulate; leaves 5--7-foliolate; petioles slender or stout, 3--14.5 cm. long, flattened and canaliculate above, densely short-pubescent with albidous, cinereous, or sordid hairs; leaflets usually unequal in size, the 2 lowermost considerably smaller than the central ones, all rather long-petiolulate on slender or stoutish densely puberulent or short-pubescent canaliculate and submargined petiolules, which are 2--38 mm. long, those of the 2 lowermost leaflets usually much shorter than those of the central ones; leaflet-blades thin-chartaceous during anthesis, more firm and heavy in age, dark- or dull-green above, usually much lighter or even albidous beneath, the central one elliptic, ovate-elliptic, or subobovate, 5--27 cm. long, 1.8--12.5 cm. wide, acute or acuminate at the apex, sometimes rather long-acuminate, entire, varying from obtuse, subcordate, or rounded to acute or short-acuminate at the base, densely or sparsely short-pubescent, strigillose, or puberulent above, densely matted-tomentulose, velutinous, or short-pubescent beneath with albidous, cinereous, or sordid-gray pubescence, varying to much more sparsely short-pubescent on water-sprouts; inflorescence axillary, paniculate-thyrsoid, 8.5--30 cm. long, 2--15 cm. wide, normally composed of 2 or 3 pairs of lateral paniculate branches, which are 4--13 cm. long, each branch composed of 3--6 pairs of rather long-stipitate cymes, many-flowered, usually rather loose, densely canescent-puberulent or short-pubescent throughout; peduncles, rachis, and inflorescence-branches rather slender, often distinctly flattened, densely cinereous-puberulent or short-pubescent like the twigs and petioles, the pubescence often wearing off from the angles and exposing a nigrescent under-surface; peduncles 3.5--11.5 cm. long; pedicels very slender or filiform, 1--3 mm. long, puberulent or short-pubescent; bracts few (or absent), caducous, simple, long-stipitate, ovate, to 2.5 cm. long, resembling the leaflets in puberulence; bractlets linear, 2--5 mm. long, densely short-pubescent; prophylla minute, linear, about 1 mm. long, densely short-pubescent; flowers pleasantly fragrant; calyx campanulate, 2.5--3 mm. long, canescent-puberulent or pubescent, subbilabiate, acutely 5-toothed, 3 teeth on the inferior and 2 on the upper

lip, the middle inferior tooth broader and shorter than the rest; corolla varying from blue, bright-blue, sky-blue, light-blue, or deep-blue to lilac-blue, lilac, bluish-purple, purple, or bright-purple, sparsely evanescent-puberulent on the outside, barbellate at the insertion of the stamens and puberulent at the base of the inferior lip within, its tube 5--6 mm. long, its limb bilabiate, the 2 posterior lobes small, subrotund, about 2 mm. long and wide, reflexed, the 3 anterior lobes 5—6 mm. long, spreading, the median lobe slightly pulverulent on the upper surface near its base; fruiting-calyx patelliform, 7--8 mm. wide, reflexed in age; fruit fleshy or hard, depressed-globose, 12--15 mm. long and wide, smooth, yellow.

Lundell reports the vernacular Mayan names "yaxnic" and "yaaxnic" (meaning "blue flower") and describes the species as "generally a small to medium-sized tree, but sometimes reaching a diameter of 70 cm. and a height of 20 meters; common in climax forest and secondary upland forest" in the middle tier of the zopotal, in flatland forests, among the tallest trees of the marginal forests, among the second- and third-story trees of the flatland high forests, among the third-story trees of the high forests on well-drained uplands, and in the secondary forests covering abandoned milpas on the Yucatán Peninsula. He calls it a characteristic tree of the limestone area in British Honduras. Steggerda writes the name "yaax nic"; Millspaugh in the reference cited above records the name "yaxnic", although he erroneously identifies Gaumer 607 as V. pyramidata B. L. Robinson, a more northern Mexican species not as yet known from the Yucatán Peninsula. Gentle 1756 was determined and distributed by Standley as V. kuylenii, but is identical with the two Hummel collections. These three sterile collections apparently represent an anomalous British Honduran form of V. gaumeri with very sparse pubescence, or else represent leaves taken from coarse-growing watersprouts. The species has also been confused with and misidentified as V. umbrosa Sw.

Schipp describes the species as a "giant forest tree growing on broken pine ridge, in a poor class of soil composed mainly of quartzite". He states that the tree has a spreading crown and that the hard wood is yellow and fairly tough, or, on another label, white when felled and close-grained. On one label he says "wood soft, never used". Again, he describes it as "a large tree growing in primary forests, in poor soil, magnificent with its bright blue flowers and yellow fruit, occasional". He reports a tree 40 feet tall and 9 inches in diameter; another 40 feet by 10 inches; another 40 feet by 24 inches; and still another 50 feet by 24 inches. Gaumer reports a tree 60 feet tall and 24 inches in trunk diameter.

It has been collected in anthesis from February to September and in fruit in February, May, June, and July. It is said to be a very handsome tree, with masses of light-blue or sky-blue flowers. Standley reports that "the tough wood is used for the construction of carts, boats, and agricultural implements". Gaumer states that "yax" in the common names in this case means

"blue", as there is no word for blue in the Mayan language ("yax" really means green!), and "nic" means "flower". He states that in March the flowers are so abundant that the tree looks like a mass of brilliant blue; "the wood is very tough and much sought for in the construction of wagons, boats, and in the decortication of the henequen fiber." Bequaert adds that the leaves are used as a horse fodder and that the tree is called "dachnik", meaning "green ear" in Mayan. It is called "flor azul", "flor azule", or "barrabas" in Honduras, "barbás" or "jocote de mico" in Guatemala, "yaxnic", "yaaxnic", "yaax nic", or "blue flower" in Yucatán, and "blue blossom", "fiddlewood", "matasano", "monkey fiddle", "yashnik", "yash snick", or "yaxnic" in British Honduras. Two other variant spellings are recorded: "locote de mico" and "matasamo".

The type of the species was collected in the vicinity of Izamal, Yucatán, Mexico, in March or April, 1895, by George Franklin Gaumer (no. 607), while the type of V. longeracemosa was found in sandy gravel at 600 feet altitude at Quirigua, Izabal, Guatemala, on May 31, 1919, by Harry Nichols Whitford and L. R. Stadtmiller (no. 74), and is deposited in the United States National Herbarium at Washington. The wood specimen no. 3733 in the Yale School of Forestry is from this latter collection and was taken from a tree 60 feet tall, with a trunk diameter of 16 inches. Bartlett says "diam. 6 ft." on a label, but it is not clear what he means by this. A photograph of the tree from which Pittier 8599 was collected is in the United States National Herbarium.

The species is said to inhabit woods, pastures, advanced forests, open river-valley forests, upland sapodilla forests, open forests on semi-arid highlands, and primary forests, and also to be found on hillsides, acahual lands, and heavy clay soil over calcareous substrata, as well as in second growth and in ravines of streams in semi-arid uplands. It ascends from 40 to 1665 meters altitude. Matuda says that it occurs "also in Chiapas". Mature leaves can be seen on Lundell 417 and 4933 and on Stevenson 17. Densely long-villous insect-galls, causing abnormal ovaries and fruits, are to be seen on Lundell 417 at Kew, Hummel s.n. at Kew, and Schipp 313 at Washington. The sterile Hummel 67 sheets at Kew, obviously from a sucker and probably from the galled tree from which his unnumbered specimens came, have the largest leaflets yet seen for this species and these have the sparsest pubescence beneath. They also have the vein and veinlet reticulation finely prominulent above, while usually it is indiscernible above and obscure beneath. The Haenke 1519 and 1673 and Steyermark 38121 specimens are sterile and of the glabrescent form.

V. gaumeri differs from V. pyramidata in being a tree with longer petiolules on its leaflets, the petioles and petiolules being usually velvety-pubescent, the lower leaflet-surface paler, and the flowers smaller, with no villous hairs at the base of the anterior lip on the upper surface and a more pubescent and

more sharply dentate calyx. Cross-sections of the ovary are seen illustrated in Junell, Symb. Bot. Upsal. 4: fig. 142 a & b (1934).

Record & Kuylen describe the tree as growing up "to 90 feet in height, with a well-formed bole 30 inches in diameter; bark smooth, thin, whitish; wood yellowish throughout, moderately hard and heavy, medium-textured, finishes smoothly, not utilized" (see Yale School of Forestry nos. 3733 and 3897). Another wood specimen is preserved on the Edwards 593 specimen in the Arnold Arboretum herbarium. For detailed description of the wood anatomy see Record & Mell, Timbers Trop. Am. 526--527 (1924). Winzerling says it is "a well-known tree here and very common. Compared to Mayflower (Flor de Mayo) which has large pink flowers in big bunches or clusters, it has small purple flowers, a single flower resembles that of the Cortez in shape and size, but not in color (Cortez's flower is yellow)."

Citations: MEXICO: Campeche: C. L. Lundell 1327 (A, Ak--18662, Ca--486832, Du--224418, E--1017662, F--700449, G, Mi, Mi, Mi, N, N, Nt); Matuda 3905 (F--1026373, Mh). Tabasco: Matuda 3115 (F--1028189, Mh, N), 3231 (F--1026860, Mh, N). Yucatán: Bequaert 63 (A, F--710790), 98 (A, F--710798); G. F. Gaumer 607 (A--isotype, B--isotype, Bm--isotype, Br--isotype, Ca--446152--isotype, Cp--isotype, E--116182--isotype, Ed--isotype, F--36410--isotype, F--437585--isotype, G--type, Gg--159706--isotype, I--isotype, K--isotype, Lu--isotype, Mi--isotype, N--isotype, N--photo of type, S--isotype, S--photo of type, Us--isotype, V--isotype, W--268732--isotype, X--isotype, Z--photo of type), 24000 (Bm, Cb, E--951543, F--552002, Gg--160581, N, W--1268104), s.n. [Izamal, 1888] (F--181603, K); Gaumer & sons 23251 (Cb, E--804641, F--446682, G, N, Oa, Ur, W--842261), 23567 (Ca--446068, Cb, Cp, E--953808, F--465942, Mi, N, W--1265875), 23568 (A, Bm, Cb, F--465944, Gg--160537, K, N, S, Us, V, W--1265876); Lundell & Lundell 7321 (Mi, Mi, N); A. C. V. Schott 582 (F--195496, F--195498); Steere 1558 (E--1087003, F--668586, La, Me, Mi, N); Steggerda 27c (F--390412), State undetermined: Haenke 1519 (N), 1673 (N). GUATEMALA: El Petén: H. H. Bartlett 12733 (Ca--602670, Du--240843, E--1091148, F--663988, Gg--233204, G, I, K, Mi, N, N, S, W--1493232); Egler 42-233 (Ld); C. L. Lundell 1509 (Du--248359, F--662349, Mi, N, W--1588985), 2662 (E--1087158, F--685316, Me, Mi, S), 2791 (F--685315, Gg--233251, K, Mi), 3540 (Mi, S). Izabal: Pittier 8599 (N, W--1013498); Steyermark 38121 (F--1058117); Whitford & Stadtmiller 74 (G, N--photo, W--42402, W--1012333, Y, Z--photo). BRITISH HONDURAS: H. H. Bartlett 13130 (Au, Mi, N, N, S); M. Chanek 184 (F--706180, Mi, N); Gentle 63 (F--696276), 1756 (F--790947, Mi, Mi), 2528 (Dp--29053, F--944826, Mh, Mi, N), s.n. [Lundell 4933] (E--1043749, I, N, N, S); Heyder 1 (W--1317233, Y); Heyder & Kinloch xxxv(W--1405635); Hummel 67 (K, K), s.n. [Botanic Station, 11.3.21] (K, K, K); Karling 21 (F--599862, W--1406549); C. L. Lundell 417 (B, Ca--

406352, Du--189924, F--712046, K, N, W--1472682); W. C. Meyer 61 (F--659148); Schipp 197 (B, Bm, Ca--384168, Cb, E--982907, F--593155, G, J, K, K, Mi, N, S, W--1492089), 313 (A, B, Bm, Bm, Ca--404258, Cb, Cb, E--987714, F--659055, G, J, K, Mi, N, S, W--1586293); D. Stevenson 17 [Mus. Yale School Forest. 11997] (F--572641, Y); N. Stevenson s.n. (W--1266026, Y); Winzerling III.3 (W--1315701, Y). HONDURAS: Comayagua: J. B. Edwards 593 (A, B, Ca--522764, F--688121, W--1588674), P.141 (A, B, F--662637, W--1588657), P.344 (A, B, Ca--522660, F--662636, W--1588618); Scherzer s.n. (V, V). Copán: Pittier 8470 (G, N, W--1083866). Yoro: Yuncker, Koepper, & Wagner 8165 (Dp, F--944385, N), 8625 (Dp, F--944381, N).

VITEX GEMINATA H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 213--214. 1901.

Literature: Pearson in Thiselt.-Dyer, Fl. Cap. 5: 213--214. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 56 & 82. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 103 (1942) and [ed. 2], 122 & 201. 1949.

Large shrub; branches stout, 6-angled, striate, glabrescent, with a smooth purplish bark; internodes elongate; leaves ternate, 5-foliolate; petioles stout, 2.5--3 cm. long, subterete, ampliate at the base, glabrous except for the puberulent or pubescent base and apex; leaflet-blades coriaceous, oblanceolate, very shortly acuminate, obtuse, entire, somewhat thickened and revolute along the margins, dark-brown and glabrous above in drying, lighter beneath, glabrous except for the puberulent veins, eglandular, the terminal one 6.5--7 cm. long and 2--2.2 cm. wide, the lateral ones smaller; petiolules 2--6 mm. long, grooved, puberulent or glabrous; secondaries 8--12 on each side, spreading, depressed above, prominent beneath; cymes lax, divaricate, a pair in the axil of each leaf, equaling or somewhat exceeding the subtending leaf, bracteate; peduncles angular, 4.5--6.5 cm. long, prominently ribbed, appressed-puberulent; bracts linear-elliptic, 1--1.6 cm. long, acute, attenuate at the base into a stalk about half as long as the blade, puberulent or pubescent; flowers short-pedicellate, ebracteolate, about 1.3 cm. long; calyx campanulate, about 3 mm. long, obscurely nerved, glabrous on the inner surface, finely pubescent outside, its rim unequally and minutely 5-toothed; corolla purplish, its tube slightly curvate, 8--10 mm. long, glabrous below, appressed-pubescent on the outside above, puberulent within above the insertion of the stamens and pubescent in the throat, its limb reflexed, densely pubescent outside, minutely so within; stamens inserted below the middle of the corolla-tube, exserted; filaments ampliate and villous toward the base; ovary subglobose, glabrous, wrinkled; fruit not known.

The type of this species is Gerrard & McKen 2027, collected by the Umlatusi River in Zululand.

VITEX GIGANTEA H.B.K., Nov. Gen. & Sp. Pl. 2: 245--246. 1818.

Literature: H.B.K., Nov. Gen. & Sp. Pl. 2: 245--246. 1818; Popenoe, Contrib. U. S. Nat. Herb. 24: 133. 1924; Moldenke, Alph. List Common Names 21. 1939; Moldenke, Geogr. Distrib. Avicenn. 22 & 24. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 35, & 103. 1942; Moldenke, Phytologia 2: 119. 1944; Holdridge & al., Forests West & Cent. Ecuador 67. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70, 74, & 201. 1949; Acosta Solis, Publ. Dept. Forest. Ecuador 7: 39. 1949.

Tall tree, to 32 m. tall; trunk to 75 cm. in diameter; wood easy to cut, strong but somewhat brittle, holds shape and finishes well, durable; sapwood straw-colored, deepening in color after exposure to air; heartwood light-brown, somewhat lustrous, with no distinctive odor or taste, moderately hard and heavy, with an oven-dry specific gravity of 0.55, weighing about 34 pounds per cubic foot, with medium texture, the grain variable, from very straight to irregular; branches and branchlets medium-slender, obtusely tetragonal or terete, varying from softly tomentose-hirsute to more or less densely puberulent, less so in age, brown; twigs densely short-pubescent with flavescent or fulvous hairs; nodes not annulate, mostly somewhat ampliate; principal internodes 1--5.5 cm. long or more abbreviated; leaf-scars large, corky, prominent; leaves decussate-opposite, usually developed with or after the flowers, 3--5-foliolate; petioles slender, 4.8--10 cm. long, densely short-pubescent with flavescent or fulvous hairs, somewhat flattened above, sometimes but usually not canaliculate, not margined nor ampliate at the base; petiolules slender, 1--7 mm. long, densely puberulent or short-pubescent like the petioles, canaliculate-margined, the terminal one somewhat longer than the rest; leaflet-blades thin-membranous at time of anthesis, thin-chartaceous when mature, rather uniformly bright- or dark-green on both surfaces or lighter beneath, the immature ones nigrescent in drying, oblong or broadly elliptic, the terminal one 5.7--20 cm. long, 3.1--8.2 cm. wide, acute or acuminate at the apex, entire, acute or acuminate at the base, glabrous or more or less sparsely puberulent above (especially along the midrib and secondaries), rather densely short-pubescent beneath with flavescent or brownish hairs; midrib slender, plane or subimpressed above, rounded-prominent beneath; secondaries slender, 8--15 per side, arcuate-ascending, usually not much arcuate, mostly plane above, prominent beneath, arcuately joined near the margins; vein and veinlet reticulation very fine, abundant, obscure or indiscernible above, prominulent beneath (on mature leaves); inflorescence axillary, cymose, 2--5.5 cm. long, 1.5--4 cm. wide; peduncles about 2.5 cm. long, pubescent; cymes 3--6-flowered; flowers with a slight perfume; calyx campanulate, 5-toothed, the teeth obtusish; corolla lilac or violet, its tube short-cylindric, its limb dilated, bilabiate, the upper lip erect, 2-lobed, the lower lip 3-lobed, spreading, mottled with white toward the pilose base, the central lobe 3 times as long as the lateral ones; filaments pilose at the base; fruit green (in December), the size of an olive, edible.

The type of this rather puzzling species was collected by

Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland (no. 3853) at Guayaquil, Ecuador, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The species has been found in coastal jungles near sea level, in dense wet or dry tropical forests, and in mountain forests, ascending to 200 meters altitude, blooming in November and fruiting in December. It is called "moconto" and "pechiche". The wood is used for construction, decking for ships and bridges, railway ties, and other purposes where it will be exposed alternately to sun and water. Miss Mexia says of it: "good hard wood, common." Her no. 6177 is in anthesis and is practically leafless. Acosta Solis reports that it is cultivated in the "western region" of Ecuador.

The Mexia 6770 collection is in fruit, with mature pubescent leaves, while the Peruvian specimens are mostly in anthesis with very immature leaves that are very sparsely puberulent above. It is not certain that both populations represent the same species. The plant is obviously very closely related to V. cymosa Bert. and V. flavens H.B.K., with both of which it has been misidentified by herbarium workers. Tessmann 4723 at the Conservatoire et Jardin Botaniques at Geneva is identical with Mexia 6177 in the Britton Herbarium at New York.

Citations: ECUADOR: El Oro: E. L. Little 6634 [Herb. U. S. Dept. Agr. Forest Surv. 95915] (N). Guayas: Fagerlind & Wibom 626 (S); Humboldt & Bonpland 3853 (N--photo of type, N--isotype, P--type, P--isotype, P--isotype, Z--photo of type); Mexia 6770 (F--863746, N, N--photo, Qu, S, W--1592023, Z--photo); Mille s. n. [Guayaquil, 1926] (F--920240). Los Ríos: Mexia 6679 (N); Kyer & Little 6504 [Herb. U. S. Dept. Agr. Forest Surv. 95914] (N). Province undetermined: Bonpland s.n. (N, P). PERU: Mexia 6177 (En, F--877769, Gg--238809, I, N, S); Tessmann 4723 (B, Cb).

VITEX GIORGII DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 103—104. 1929.

Literature: DeWild., Contrib. Etud. Fl. Katanga Suppl. 2: 103—104. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 61. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 201. 1949.

Shrub; branches subtetragonal, short-tomentose and gray-yellowish toward the apex, glabrescent below; leaves 5-foliolate, the central leaflet usually larger than the others; petioles not canaliculate above, more or less flattened toward the base, short-tomentose; petiolules 3—11 mm. long; leaflet-blades lanceolate-elliptic, 3—11 cm. long, 1.6—4.8 cm. wide, more or less long-acuminate at the apex, entire, cuneate at the base and narrowed into the petiole, glabrous above, densely tomentose beneath; secondaries about 17 pairs, somewhat prominent beneath; tertiaries subparallel but difficult to discern because of the tomentum; inflorescence axillary, cymose; peduncles 3.5—6 cm. long, short-

tomentose; cymes loose, many-flowered, more or less dichotomously branched, the branches to 11 mm. long; bractlets short-tomentose, to 17 mm. long, caducous, the lower ones filiform-lanceolate, the upper ones filiform; flowers pedicellate, more than 20 per inflorescence; pedicels 1--7 mm. long, velutinous, the longest ones at the center of each dichotomy; calyx campanulate, about 3 mm. long, subbilabiate, velutinous or short-tomentose on the outside, glabrous within, the lips obscurely dentate, the teeth rounded and short; corolla short-tubular, the tube 4--5 mm. long, velutinous outside, the limb 5-lobed, the anterior lobe cuneate, about 2.5 mm. long and 3 mm. wide, velutinous on the outer surface, glabrous on the inner surface; ovary subglobose-subtruncate, sparsely glandulose, pilose at the apex.

The type of this species was collected by S. de Giorgi (no. 391) -- in whose honor it is named -- at Etoile du Congo, Belgian Congo, in January, 1923. The species is said by DeWildeman to be very closely related to V. bequaerti DeWild. He knew V. giorgii only from a single flowering branch, while V. bequaerti was originally described from material in the fruiting condition. Later collections of the latter, however, agree well with the type. V. giorgii has larger leaves, the pubescence on the lower surface of the leaflets is more cottony-villous, and the smaller venation is not clearly visible as it is in V. bequaerti.

VITEX GLABRATA R. Br., Prodr. 512. 1827.

Synonymy: Vitex cunninghami Schau. in A. DC., Prodr. 11: 691. 1847. Vitex cunninghami DC. ex Ettingsh., K. Akad. Wiss. Wien Denkschr. 28: 219 [Fossile Flora Bilin 2: 31]. 1868. Vitex leucoxylon Schau. apud Watt, Dict. Econom. Prod. Ind. 6 (4): 247, in syn. 1893 [not V. leucoxylon L. f., 1781, nor Roxb., 1814, nor Wall., 1847, nor Schau., 1893, nor Roth, 1956]. Vitex minahassae Koord., Meded. Lands Plant-tuin. Buitenz. 19: 560 & 645. 1898. Vitex helogiton K. Schum. in K. Schum. & Lauterb., Nachtr. Fl. Deutsch. Südsee 362. 1905. Vitex pentaphylla Merr., Philipp. Journ. Sci. Bot. 4: 320. 1909 [not V. pentaphylla Lamb., 1940, nor Pavon, 1940, nor Sessé & Moc., 1940]. Vitex nitida Merr., Philipp. Journ. Sci. Bot. 7: 343. 1912. Vitex cunninghamii Schau. apud H. J. Lam, Verbenac. Malay. Arch. 204, in syn. 1919. Vitex glabrata Blume, in herb. Vitex macrocarpa Koord. & Val., in herb.

Literature: Rheede, Hort. Ind. Malab. 4: 75--76, pl. 36. 1683; R. Br., Prodr. 512. 1827; Schau. in A. DC., Prodr. 11: 691 & 695. 1847; W. Elliot, Fl. Andhr. 134. 1859; Dalz. & Gibs., Bombay Fl. 201. 1861; Benth. & Muell., Fl. Austral. 5: 31. 1870; Brandis, For. Fl. NW. & Cent. India 3: 370. 1874; Kurz, For. Fl. Brit. Burma 2: 273. 1877; Ind. Forester 10: 222. 1884; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 588. 1885; J. C. Lisboa, Useful Pl. Bombay 108. 1836; K. Schum. & Hollrung, Fl. Kaiser-Wilhelmsl. 121. 1889; Watt, Dict. Econom. Prod. Ind. 6 (4): 247. 1893; Jacks., Ind. Kew. 2: 1213. 1895; Koord. & Val., Bijdr. Booms. 7: 208--210. 1900; K. Schum. & Lauterb., Fl. Deutsch. Südsee 523.

1900; K. Schum. & Lauterb., Nachtr. Fl. Deutsch. Südsee 362. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 852. 1909; Koord., Exkurs. Fl. Java 3: 137. 1912; Merr., Philipp. Journ. Sci. Bot. 7: 343. 1912; Koord. & Val., Atl. Baumart. 2: 6, pl. 299. 1914; Heyne, Nutt. Plant. Nederl. Ind. 4: 113--114. 1917; Basu, Ind. Medic. Pl. 3: 3, pl. 742. 1918; H. Hall., Meded. Rijks Herb. Leid. 37: 54. 1918; H. J. Lam, Verbenac. Malay. Arch. 203--205 & 369. 1919; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5 (2): 175--176. 1922; Bakh. & Lam, Bull. Jard. Bot. Buitenz., sér. 3, 4 (2): 285. 1922; E. D. Merr., Enum. Philipp. Flow. Pl. 3: 394. 1923; Heyne, Nutt. Plant. Nederl Ind. 1316. 1925; H. J. Lam in Engl., Bot. Jahrb. 59: 93. 1925; Stapf, Ind. Lond. 6: 478. 1931; Kanehira, Fl. Micronesia 345. 1933; Crevost & Pételot, Bull. Econom. Indo-Chine 37: 1294--1295. 1934; Moldenke, Alph. List Common Names 2, 6, 17, 27, 29, & 30. 1939; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Suppl. List Common Names 2--4, 8--15, & 19--22. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Kanehira & Hatusima, Bot. Mag. Tokyo 56: 115. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 59--61, 63, 64, 66, 70, 75, & 103. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Moldenke, Phytologia 2: 119. 1944; Bruno & d'Urso, Giard. Bot. Colon. Semina Anni 1949: 29. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 128, 129, 137--140, 142, 144, 147--149, 154, 165, & 201. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949.

Illustrations: Rheede, Hort. Ind. Malab. 4: pl. 36. 1683; Koord. & Val., Atl. Baumart. 2: pl. 299. 1914; Basu, Ind. Medic. Pl. 3: pl. 742. 1918; Kanehira, Fl. Micronesia 345. 1933.

Small to very large stocky or crooked tree, 10--25 m. tall, or a large shrub; trunk 30--125 cm. in diameter, star-shaped at the base, with indications of buttresses 1 m. high, often 20 cm. in diameter at a height of 20 cm. above the ground; bole 15 m.; wood moderately soft, whitish, soon discoloring to dirty-white, odorless, tasteless; bark thick, varying from gray or light-gray to grayish-white, finely checked, rough, peeling off in small pieces; branches numerous above the middle, forming a dense elongated or rounded crown; branchlets obtusely quadrangular, more or less fulvous-pubescent or eventually glabrescent; twigs ascending, greenish-brown, with elongated lighter brown lenticels; leaves deciduous, 3--5-foliolate, glossy-green, on seedlings 1-foliolate and serrate; petioles green, ascending, 7--17 cm. long, slender, glabrous or somewhat pubescent; leaflet-blades varying from membranous to chartaceous or thin-coriaceous, horizontally recurved, strongly conduplicate on the upper sublucid or darker green surface, elliptic or elliptic-oblong, varying to subobovate, sometimes subrotund or lanceolate, brunnescent or subnigrescent in drying, obtusely or acutely acuminate at the apex, varying from broadly cuneate to narrowly long-attenuate at the base, entire (or serrate on seedlings), glabrous except for the midrib and larger venation (when young) above, glabrous or very sparsely pubescent beneath and more or less barbellate in the axils, the lowest ones 2.5--10 cm. long and 1--5.5 cm. wide, with 6--8

pairs of secondaries, the lateral ones 14--26 cm. long and 7--11 cm. wide, with 10--12 pairs of secondaries, and the terminal ones 15--31 cm. long and 8--13.5 cm. wide, with 12--17 pairs of secondaries; midrib minutely pubescent above, glabrous or somewhat pubescent beneath; secondaries slender, 6--17 per side; petiolules 0.2--2 cm. long, variable, those on the terminal leaflets longest and on the lowest leaflets shortest; inflorescence erect, greenish, slightly fragrant; cymes axillary, lax, slender, minutely pubescent, dichotomous, few-flowered, 7--22 cm. long, 7--8 cm. wide; peduncles 2--10 cm. long; bracts small, caducous, about 3 mm. long; pedicels 1--3 cm. long, often bearing 2 minute opposite bracteoles; calyx violet-green, cupuliform, 1.5--4 mm. long, 2.5--3 mm. wide, minutely appressed-pubescent, its rim with 5 small teeth; corolla cream-colored, smudgy-white, or white, varying to yellowish-white, 5--6 mm. long, minutely pubescent throughout on the outside, glabrous below on the inner surface, densely villous in the throat and up to the middle lobe of the lower lip within, the upper lip pink or purplish-streaked, with faintly violet hairs, 5--8 mm. long, 2.5--4 mm. wide, entire, the smaller lobes 2--2.5 mm. long, 1.5--2 mm. wide; stamens exserted, 6--7 mm. long; filaments whitish, villous on the lower half, glandulose on the upper half, stout and ampliate at the base; anthers purplish-brown; style 7--9 mm. long, exserted; stigma shortly bifid; ovary glabrous, minutely villous at the tip; fruit drupaceous, obovoid or bluntly elliptic, 8--20 mm. long, to 10 mm. wide, green or yellow-green when immature, black when ripe, sweet, edible.

Williams reports finding a tree of this species 60 feet tall, with a trunk 14--18 inches in diameter. It inhabits open grasslands in fertile soil and high rain forests and is common along the edge of evergreen jungles, from altitudes of 5 to 1080 meters, blooming from March to May and July to September, collected in fruit in January, April, and June. It is said to be common in deciduous forests in Thailand.

The type of V. minahassae is Koorders 19553b from near Kajoewatoe, commonly called "saoe-sela" or "saoe sĕla" there. The actual type is sheet no, 24132 in the Buitenzorg herbarium, and contains neither flowers nor fruit, its leaves are glabrous beneath and scarcely glandulose. Koorders says that the name "kajoe-gopasa" given on page 560 of his work is an error, as this name applies to V. celebica Koord. [=V. quinata (Lour.) F. N. Will.]

Heyne says of this species "aan de zuidkust met zuilvormigen stam en hoog aangezette kroon, op het Wilisgebergte daarentegen met korten, laag vertakten stam. Hij is verbreid over den geheelen Maleischen Archipel en groeit op Java verstrooid beneden 900 M. zeehoogte, doch is op sommige plaatsen niet zeldzaam. Het hout wordt soms voor huisbouw gebruikt: oude boomen zouden bij Tjilatjap zeer vaak hol zijn." He also says "Boom van Noord-Celebes, door Koorders alleen gevonden bij Kajawatoe en daar steriel ingezameld; volgens hem (Minahassa, bl. 560) wordt het hout voor huisbouw zeer hoog geschat. Op bl. 170 heet het goed

tegen weer en wind bestand en geschikt voor planken en balken."

Watt says it is "common from South Assam and Cachar to Malacca. Considerable confusion exists in Indian literature between this species and V. leucoxylon, Linn. f., a native of South India and Ceylon, which Kurz, and following him, Gamble, appear to have united. It is probable, however, that most of the information here given refers to V. glabrata.....The bark and root are used as astringents in the Andaman Islands....The tree flowers in April, and produces a small black fruit containing very soft pulp, which is eaten by the Burmese in the Andaman Islands..... [The wood is] grey with a satiny lustre, hard, close-grained, durable; weight about 42 lbs. per cubic foot. It is used for cart-wheels, and deserves attention for furniture and other purposes." The label on Native collector 343 indicates that the wood is used for fuel supply in Siam. Vidal says it has medicinal uses in Laos.

Material of this species has been found in herbaria misidentified as V. celebica Koord., V. cofassus Reinw., V. cuneata Schum. & Thonn., V. heptaphylla A. L. Juss., V. heterophylla Roxb., V. littoralis Decne., V. loureiri Hook. & Arn., V. parviflora A. L. Juss., V. pentaphylla Merr., and V. quinata (Lour.) F. N. Will. The Boschproefst. Kiempl. 2065 cited below is said to be the source of Noltée 4060, while no. 2028 is said to be from the same seed stock as 2065. It consists of small seedlings with 1-foliolate serrate leaves.

Watt cites, in addition, V. bombacifolia Wall. and V. pallida Wall. as synonyms, and Lam follows him in this disposition, but I place these two binomials in the synonymy of var. bombacifolia (Wall.) Moldenke.

Common names for the species include "ampapalút", "amuláon", "ashwal", "banga koeba", "bhodiya", "bigboel", "bihbul", "boeboeloe", "boetboet", "boñgóg", "boñgúg", "bonkolion", "gĕntileng", "gĕntilĕng", "gĕntileng ketileng", "goda", "gofasa batoe", "horina", "htoukshar", "kalipápa-aso", "kamoláuan", "karil", "karril", "katendeng tandro", "kelilĕng", "ketilèng", "kĕtilĕng", "khi hen", "khi-hen", "khi nok", "ki bigchbul", "ki katjapi", "ki now", "laban kĕtilĕng", "laban kĕtilĕng hleng", "longarbi thiras", "longarbis thiras", "luki", "neva-lédi", "popoul ach sat", "popoul tuk", "saoe-sela", "sasalit", "sengeni", "senkane", "sheras", "sherasa", "songarbi", "tálang-puso", "tilĕng", "tin nŏk", "tokra", and "topas".

Koorders 19547b was determined as V. minahassae by Koorders and Valeton in January, 1898, as V. celebica by Koorders in May, 1898, and as V. quinata by Bakhuizen van den Brink in 1934! Kanehira & Hatusima, in the reference cited above, cite their no. 14138 from Momi, collected on April 10, 1940, in high rain forests at 100 meters altitude. They give as the distribution of the species "India, Malaya, Philippines, Micronesia, and northern Australia". Lam cites, in addition to material cited below, Ledermann 10474 from Northeastern New Guinea, Forbes 3784 from

Timor, and Junghuhn s.n. [Herb. Lugd.-Bat. 908267-1210 & 1220], Korthals s.n. [Herb. Lugd.-Bat. 908272-136], and Kuhl & Van Hasselt s.n. [Herb. Lugd.-Bat. 909107] from Java. He gives as this species' distribution: "Britisch Indien, Siam, Burma, Cochinchina, Malayische Halbinsel, Java, Timor, Neu Guinea, Palawan, Mindanao, Nord-Australien, Queensland". Merrill, in his Enumeration of Philippine Flowering Plants, states that it is found also on the islands of Balabac and Negros, and cites, in addition, Merrill 2162, Klemme s.n. [Herb. Philipp. Forest. Bur. 19546], Miranda s.n. [Herb. Philipp. Forest. Bur. 20638 & 20771], Razon s.n. [Herb. Philipp. Forest. Bur. 23671], Somonte s.n. [Herb. Philipp. Forest. Bur. 24817], and Whitford & Hutchinson s.n. [Herb. Philipp. Forest. Bur. 9490].

Citations: INDIA: West Bengal: Helfer 17 (Bz--24143, N, S); King's Collector 407 (Na--16232). BURMA: Upper Burma: Kurz 2382 (Bz--23809). INDOCHINA: Laos: Vidal 360 (Z), 1843 (Z). State undetermined: Harmand s.n. (S). THAILAND: Dee 349 [Herb. Roy. Forest Dept. 7638] (Z); Kostermans 99 (Bz--73300), 705 (Bz--73303); Native Collector 343 (S); Pierre 110 (S); Smitinand 1415 [Herb. Roy. Forest Dept. 7797] (Z). PHILIPPINE ISLANDS: Culión: Ponce s.n. [Herb. Philipp. Forest. Bur. 28904] (Bz--24117). Luzon: Ahern 110 (Bz--24564), 1104 (Bz--24118); Sulit s.n. [Philipp. Nat. Herb. 2646] (Bz--72681). Mindanao: W. I. Hutchinson s.n. [Herb. Philipp. Forest. Bur. 11245] (N); Ramos & Pascasio s.n. [Herb. Philipp. Bur. Sci. 34472] (N); R. S. Williams 2949 (Ms, N, N, N), s.n. [June 16, 1905] (Ms). Mindoro: M. Ramos s.n. [Herb. Philipp. Bur. Sci. 39371] (Bz--24563). Palawan: Cenabre s.n. [Herb. Philipp. Forest. Bur. 29988] (N); E. D. Merrill 9330 (Bz--24119, N). JAVA: Berger 1 [Boschbouwproefst. Ja.125] (Bz--24046); Boer 4060a (Bz--24048, Bz--24049, Bz--24050); Boschwezen 103 [Herb. Bot. Var. 453] (Bz--24047); Koorders 9738b (Bz--24072), 9739b (Bz--24069, Bz--24070), 9740b (Bz--24071), 9743b (Bz--24078, Bz--24079), 9744b (Bz--24076, Bz--24077), 9745b (Bz--24063), 9746b (Bz--24065, Bz--24066), 9747b (Bz--24081, Bz--24082), 9748b (Bz--24064), 9749b (Bz--24080), 9793b, in part (Bz--24059, Bz--24060), 9825b (Bz--24039), 9843b (Bz--24038), 10129 (Bz--24068), 11058b (Bz--24083, Ut--53724), 12467b (Bz--24086, Bz--24087), 12912b (Bz--24090), 20075b [1008c] (Bz--24061, Bz--24062), 27046b [691*] (Bz--24084, Bz--25657), 28170b [96d] (Bz--24073), 28183b [11d] (Bz--24074, Bz--24075), 29818b [2278f] (Bz--24093, Bz--24094, Ut--58725, Ut--58726), 36092b (Bz--24091, Bz--24092); Martono 15 [Boschbouwproefst. Ja.2815] (Bz--24054); Noltée 4060 (Bz--24057); Van Steenis 3247 (Bz--24053); Veer 53 [Boschbouwproefst. Ja.3305] (Bz--24145). BORNEO: Zwaan 824 [Boschbouwproefst. BB.18819] (Bz--25444). CELEBES: G. R. Bish 4 [Boschbouwproefst. BB.5570] (Bz--24123); Boschbouwproefst. BB.

5570 (Bz--24124), 6038 (Bz--24138, Bz--24139, Bz--24140, Bz--24141, N), Cel./I.85 (Bz--24128, Bz--24129); Herb. Bogoriense 23840 (Bz); Glam 4 (Bz--24137), 24 (Bz--24136); Koorders 19547b [980] (Bz--25108), 19553b (Bz--24132, Bz--24133, N--photo, Z--photo); Laleno 26 [Boschbouwproefst. BB.18025] (Bz--24126); Reppie 342 [Boschbouwproefst. BB.24999] (Bz--24121); Teijsmann 12479 (Bz--23841); A. Uno 21 [Boschbouwproefst. BB.15374] (Bz--24122); Verhoef 105 [Boschbouwproefst. BB.19590] (Bz--24126); Walangitang 6 [Boschbouwproefst. BB.3027] (Bz--23864, Ut--80726), 85.C.1 [Boschbouwproefst. Cal./I.85] (Bz--24127); Waturandang 35 [Boschbouwproefst. BB.21108] (Bz--24135), 45 [Boschbouwproefst. BB.21118] (Bz--24134). KANGEAN ARCHIPELAGO: Eteng: Backer 27467 (Bz--24099), 27850 (Bz--24100, Bz--24101). Kangean: Backer 27012 (Bz--24095, Bz--24096, Bz--24097, Bz--24098, Bz--25656). LESSER SUNDA ISLANDS: Bali: Voogd 1695 (Bz--24102). Timor: Damanae 6 [Boschbouwproefst. BB.9712] (Bz--25436, Bz--25437); Mas Nasiran 3 [Boschbouwproefst. BB.23954] (Bz--24103); Sastrodihardjo s.n. [Boschbouwproefst. BB.6876] (Bz--24106); Talakua 8 [Boschbouwprofst. BB.9809] (Bz--25434, Bz--25435); Walsh-Held 214 (Bz--24104, Bz--24105, Bz--25655). MOLUCCA ISLANDS: Mangole: Asda & Anta 26 [Boschbouwproefst. BB.29773] (Bz--25088). Tanimbar Islands: Buwalda 44 [Boschbouwproefst. BB.24263] (Bz--24107). NEW GUINEA: Dutch New Guinea: Anang 8 [Boschbouwproefst. BB.28910] (Bz--25432); Lam 1144 (Bz--24108, Bz--24109, Bz--24110, Bz--24111, Bz--24112, Ut--80740); Meyer Drees 273 [Boschbouwproefst. 25665] (Bz--24114), 583 [Boschbouwproefst. BB.25755] (Bz--24113). Northeastern New Guinea: Hollrung 672 (Bz--24115), 708 (Bz--24116, Mb). AUSTRALIA: Northern Territory: M. Holtze s.n. [Pt. Darwin; Herb. Prager 18673] (Cm, Gg--31482). CULTIVATED: Java: Boschproefst. Kiemplanten 2065 [mother plant 65] (Bz--24056); Burger s.n. [Boschproefst. 2028] (Bz--24055); Herb. Hort. Bot. Bogor. XI.I.15 (Bz--25816, N), XI.I.36 (Bz--25840, N), XI.I.36a (Bz--25841, Bz, N), XI.J.1 (Bz--24130, Bz--24131), XI.J.28 (Bz--25829, Bz--26587, Bz, N), XI.K.24 (Bz--25870), s.n. (Bz--24484, Bz--24485). Madagascar: Collector undesignated 299 (Le--29936, N--photo, Z--photo). Mauritius: Herb. Mauritius Forestry Dept. s.n. [18.1.36] (K, K); Herb. Mus. Paris. s.n. (P).

VITEX GLABRATA var. BOMBACIFOLIA (Wall.) Moldenke, Revist. Sudam. Bot. 5: 2. 1937.

Synonymy: Vitex leucoxylon Roxb., Hort. Beng. 46, hyponym. 1814 [not V. leucoxylon L. f., 1781, nor Wall., 1847, nor Schau., 1893]. Vitex bombacifolia Wall., Numer. List [48], no. 1749, hyponym (1829); C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 588, in obs. 1885. Vitex pallida Wall., Numer. List [48], no. 1751, hyponym. 1829. Vitex elegans Griff., Notul. 4: 740. 1854. Vitex leucophaea Wall. ex Moldenke, Prelim. Alph. List Invalid Names

51, in syn. 1940. Vitex bombacifolium Wall., in herb. Vitex leucophoea Wall., in herb. Vitex leucoxylon Roth, in herb. [not V. leucoxylon L. f., 1781, nor Wall, 1847, nor Schau., 1893].

Literature: Roxb., Hort. Beng. 46. 1814; Wall., Numer. List [48], nos. 1749 & 1751. 1829; Griff., Notul. 4: 740. 1854; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 588. 1885; Watt, Dict. Econom. Prod. India 6 (4): 247. 1893; H. J. Lam, Verbenac. Malay. Arch. 204 & 369--370. 1919; Moldenke, Revist. Sudam. Bot. 5: 2. 1937; Moldenke, Geogr. Distrib. Avicenn. 40. 1939; Moldenke, Prelim. List Invalid Names 50 & 51. 1940; Moldenke, Alph. List Invalid Names 52--54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55, 75, & 103 (1942) and [ed. 2], 128, 129, 165, & 201. 1949.

Shrub or tree; branchlets stout, obtusely or subacutely tetragonal, medullose, flattened and ampliate at the nodes, gray or almost white, minutely puberulent, becoming glabrate in age; twigs slender or stoutish, rather short, brown, minutely puberulent, becoming less so or even glabrescent in age; nodes annulate; principal internodes 1--5 cm. long; leaf-scars large, very corky and elevated on branchlets; buds densely pubescent; leaves decussate-opposite, 3--5-foliolate, usually fully expanded during anthesis; petioles slender, 8.5--11 cm. long, minutely puberulent throughout, not at all or but very slightly ampliate at the base, slightly disciform at the apex, convex beneath, flattened and canaliculate above; leaflets subequal or the 2 lowermost considerably reduced, all rather long-petiolulate on very slender, puberulent, deeply canaliculate, and submargined petiolules 3--35 mm. long; leaflet-blades submembranous or thin-chartaceous, rather uniformly dark-green on both surfaces or slightly lighter beneath, mostly brunnescent in drying, the central one broadly elliptic or ovate when mature, 7--18 cm. long, 2.5--8.3 cm. wide, rather long-acuminate or subcaudate at the apex, entire, rather abruptly short-acuminate at the base, sparsely strigillose-puberulent on both surfaces or glabrescent on the lamina in age, quite canescent along the midrib and secondaries on both surfaces when immature, the lateral ones similar in all respects only smaller and usually shorter-stipitate; midrib slender, flat or subimpressed above, prominent beneath; secondaries slender, 8--17 per side, arcuate-ascending, flat or subprominulent above, prominulent beneath, obscurely joined at the margins beneath; vein and veinlet reticulation rather sparse or fine and abundant, usually subprominulent above, obscure or the larger portions subprominulent beneath; inflorescence axillary, cymose, large and abundant, 8--25 cm. long, 3--14 cm. wide, very divaricate, very loosely and laxly many-flowered, long-pedunculate, 4--7 times dichotomous, the branches long and slender and wide-spreading; peduncles very slender, flattened, 4.5--11 cm. long, minutely puberulent or subglabrate in age, more or less annulate at the apex with a band of denser pubescence; inflorescence-branches slender, elongate, flattened, puberulent, and annulate like the peduncles; pedicels obsolete or very slender, puberulent, and to 1 mm. long; bractlets and prophylla linear, 1--3 mm.

long, sessile, puberulent.

The variety is based on Wallich 1749-1 (also referred to as "1749a") and 1749-2, the former collected from a cultivated tree in the Calcutta Botanic Garden, and the latter collected at Tagtomen on the Irawaddi in 1826. The type of V. elegans is Griffith s.n., collected from a tree cultivated in his own garden at Mergui in Tenasserim, Burma. The type of V. pallida is Wallich 1751 from Marteban in Tenasserim, Burma, although the original publication says "Malabarica" in error.

The variety has been collected in flower in May. Specimens have often been distributed as typical V. glabrata. The only common name recorded for it is "popoul ach sat", used in Cambodia.

Citations: INDIA: Assam: Chatterjee s.n. [Shokuti, May 1902] (Po--63440). State undetermined: Helfer s.n. [India or.] (V, V); Roxburgh 2512 (Br); Wallich s.n. (Cp, Cp, N--photo, T, Z--photo). BURMA: Tenasserim: H. Falconer 509 (Le); W. Griffith 6062 (Er, Ut--94204a); Wallich 1751 (Cb, E--photo, N, N--photo, Z--photo). INDOCHINA: Cambodia: Bejaud 519 (N). CULTIVATED: Burma: W. Griffith s.n. [Mergui] (K). India: Herb. Hort. Bot. Calcutt. s.n. (Cm, K, Le, Mu--650, Mu--1136, N); Wallich 929 (Cp), 1749-1 [1749a] (Cb--cotype, Cb--cotype, Cb--cotype, Cb--cotype, K--cotype, N--photo of cotype, Z--photo of cotype).

VITEX GLABRATA var. POILANEI Moldenke, Phytologia 4: 61. 1952.

This variety differs from the typical form of the species in having the lower surface of the leaflet-blades decidedly strigillose even when mature.

The type of the variety was collected by Eugène Poilane (no. 40849, not "40829" as stated in my original publication) near Bien Loa, Cochinchina, Indochina, on May 25, 1919, and is deposited in the Herbarium Bogoriense at Buitenzorg. The variety has hitherto been confused with the typical form of the species.

Citations: INDOCHINA: Cambodia: Pierre 1213 (N). Cochinchina: Poilane 40849 (Bz--72931--type, N--photo of type, Z--photo of type).

VITEX GOLUNGENSIS J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 330. 1900.

Synonymy: Vitex doniana Hiern apud Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 64, in syn. 1928 [not V. doniana Sweet, 1826].

Literature: Hiern, Cat. Afr. Pl. Welw. 4: 836--837. 1900; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 330. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 48, 64, & 82. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 201. 1949.

Shrub, 2.5--4 m. tall; branchlets short-pubescent; leaves 5-foliolate; petiole 12.5--15 cm. long; leaflet-blades moderately firm, green on both surfaces when mature, obovate-cuneate, the central one 12.5--15 cm. long and 6.25--7.5 cm. wide, entire,

obtuse or cuspidate at the apex, obscurely pubescent on both surfaces when mature, all the leaflets distinctly petiolulate; cymes dense, axillary, long-pedunculate, the branches appressed-pubescent; calyx campanulate, about 2 mm. long, pubescent, its rim dentate with distinct deltoid teeth; corolla small; fruit not known.

The species is based on Welwitsch 5635 from the province of Golungo Alto, Angola. Pieper, in the reference cited above, quotes this as "5636" in error and states that it was available to him for examination. Of the other two numbers cited by Baker he says that he has seen no. 5696 and that it appears to be V. madiensis var. milanjiensis (Britten) Pieper, from which, along with V. holocalyx J. G. Baker and V. doniana Sweet, he appears unable to separate it in his key. This number, however, is actually the type collection of V. madiensis var. parvifolia Hiern, which, in turn, is a synonym of V. holocalyx.

VITEX GRANDIDIANA Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 78, hyponym. 1928; Fedde, Repert. 26: 165. 1929.

Synonymy: Vitex grandidiana Scott-Elliot ex Moldenke, Known Geogr. Distrib. Verbenac., [ed 1], 53 & 103, sphalm. 1942.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 78 & 82. 1928; Pieper in Fedde, Repert. 26: 165. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 62. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 201. 1949.

Large shrub or small tree; branchlets slender, gray, obtusely tetragonal, densely short-pubescent with appressed, antrorse, brown hairs on the youngest parts, glabrescent in age; nodes not annulate; principal internodes 0.7--5 cm. long; leaves decussate-opposite, 1-foliolate; petioles rather stoutish, 5--14 mm. long, flattened and canaliculate above, densely short-pubescent with brown, appressed, antrorse hairs or merely puberulent in age; blades rather firmly chartaceous or coriaceous, uniformly grayish-green on both surfaces, dull, elliptic or oblong-elliptic, 2.5--9 cm. long, 1.6--5.3 cm. wide, varying from rounded or obtuse (on smaller leaves) to short-acuminate at the apex, entire or often irregularly dentate, often somewhat revolute along the margins, truncate or rounded at the base, glabrous on both surfaces or obscurely pilosulous along the midrib above, impressed-punctate beneath; midrib slender, plane above, prominent beneath; secondaries very slender, about 6 per side, irregular, very obscure or indiscernible above, prominulous beneath, arcuately joined in many loops near the margins beneath; veinlet reticulation indiscernible above, subprominulous beneath; inflorescence axillary, few-flowered, much shorter than the subtending leaves, the cymes subsessile, 3--5-flowered; pedicels very slender, very densely villous with fulvous divergent hairs; bractlets broad, ovate, about twice as long as wide, membranous, lightly pubescent, with plainly visible venation; calyx campanulate, herbaceous, deeply lobed to below the middle, its tube 5--6 mm. long and 6 mm. wide at the apex, densely fulvous-villous, the 5 lobes

ovate, 6--7 mm. long, attenuate-acute at the apex, more sparsely villous-pubescent, long-ciliate on the margins, the hairs fulvous; corolla infundibular or hypocrateriform, with normal development, varying from rose to red-orange or red, tinged wine-color in age, the tube about 15 mm. long, very densely villous with fulvous divergent hairs, the lobes 4--5 mm. long, villous on the back; stamens exserted about 5 mm. from the corolla-tube; ovary merely glandular.

The type of this endemic Madagascar species was collected by George Francis Scott Elliot (no. 2517) at Fort Dauphin. The species grows among rocks of laterite and granite, at altitudes of 20 to 1000 meters, and has been collected in anthesis from March to May and in July.

Citations: MADAGASCAR: Decary 10010 (P), 10040 (N, P); Humbert 20616 (N, P); Scott Elliot 2517 (K--isotype, N--photo of isotype, Z--photo of isotype), 3007 (K).

VITEX GRANDIDIANA var. ANGUSTIFOLIA Moldenke, Phytologia 3: 436. 1951.

This variety differs from the typical form of the species in having its leaves narrowly oblong-elliptic or oblanceolate, attenuate-acute or cuneate at the base, often more or less dentate toward the apex, and only 1--2.3 cm. wide.

The type of the variety was collected by Martin François Geay (no. 6702) between Fort Dauphin and Santa Luce, in the province of Fort Dauphin, Madagascar, in 1909 or before, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

Citations: MADAGASCAR: Geay 6702 (N--photo of type, P--type, Z--photo of type), 6703 (N, P).

VITEX GRANDIFOLIA Gürke in Engl., Bot. Jahrb. 18: 169. 1894.

Synonymy: Vitex bipindensis Gürke in Engl., Bot. Jahrb. 33: 295. 1904. Vitex lutea A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 506--507, hyponym. 1920. Vitex babongensis Engl., Pflanzenw. Afr. 5 (1): 192, nom. nud. 1925. Vitex grandifolia var. bipindensis (Gürke) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 73 & 81. 1928.

Literature: Gürke in Engl., Bot. Jahrb. 18: 169. 1894; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 324. 1900; Gürke in Engl., Bot. Jahrb. 33: 295. 1904; A. Chev., Vég Util. Afr. Trop. Franç. 280. 1917; A. Chev., Expl. Bot. Afr. Occid. Franç. 1: 506--507. 1920; Mildbr., Ergebn. Zent.-Afr.-Exped. 1910/11, 2: 90. 1922; Engl., Pflanzenw. Afr. 5 (1): 192. 1925; Hill, Ind. Kew. Suppl. 6: 219. 1926; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 52, 73, & 80--82, pl. 10. 1928; Pellegrin, Bull. Soc. Bot. France 84: 644. 1937; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Worsdell, Ind. Lond. Suppl. 2: 500. 1941; Moldenke, Alph. List Invalid Names 52 & 54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 46--48, 53, 75, & 103. 1942; Moldenke, Phytologia 2: 119--120. 1944; Moldenke, Known

Geogr. Distrib. Verbenac., [ed. 2], 111--114, 124, 165, & 201. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10. 1928.

Semi-herbaceous shrub or small tree, to 4 m. tall; branches and branchlets very stout, obtusely tetragonal, gray, obscurely pulverulent or glabrous, often hollow; twigs stout, very dark-brown in drying, plainly 4- or 8-angled, pulverulent-puberulent or glabrous, mostly hollow; nodes distinctly annulate, somewhat flattened and ampliate; principal internodes 1--10 cm. long; leaves decussate-opposite, 5-foliolate; petioles stout, 9--15 cm. long, dark-brown in drying, flattened or shallowly and widely canaliculate above, convex beneath, somewhat ampliate at the base, densely but obscurely puberulent throughout with extremely short brownish hairs, somewhat flabelliform at the apex; petiolules 1--5 mm. long, deeply canaliculate-margined and minutely puberulent like the petioles or mostly subobsolete; leaflet-blades chartaceous, often rather thick and moderately firm, green or dark-green above, lighter green beneath, unequal in size, the central one elliptic or obovate, varying to obovate-cuneate, 16--30 cm. long, 6-8--15 cm. wide, varying from obtuse to abruptly short-acuminate or cuspidate at the apex, acuminate or cuneate at the apex, acuminate or cuneate at the base, usually prolonged into the petiolules, entire, glabrous on both surfaces or very obscurely and minutely pulverulent above, often somewhat nitid beneath, the lateral ones similar but smaller; midrib flat or subimpressed above, often more or less undate in drying, very stout and rounded-prominent beneath; secondaries very slender, 10--15 per side, ascending, rather uniformly straight and parallel almost to the margins and there arcuate-joined, mostly flat and often undate above, prominulent beneath; vein and veinlet reticulation sparse, obscure or indiscernible above, the larger portions subprominulent beneath; inflorescence axillary or supra-axillary, abundant, shorter than the petioles; cymes 5--7 cm. long and wide, dense, many-flowered, dichotomously branched with widely divergent branches; peduncles flat and ampliate, brown, 2--2.5 cm. long (or to 5.5 cm. long at time of fruiting), many-striate, appressed-puberulent; inflorescence-branches rather uniformly 5--10 mm. long, flattened, brown, many-striate, annulate at both ends, and puberulent or finely pubescent like the peduncles; pedicels none; calyx campanulate, 3--6 mm. long, its rim obscurely toothed; corolla yellow or yellowish, 15--20 mm. long, silky on the outer surface; fruiting-calyx patelliform, incrassate, about 12 mm. wide, irregularly 5-lobed, scarious-margined, glabrate; fruit drupaceous, subglobose, about 1.5 cm. long and wide, hard, slightly 4-lobed and -sulcate, glabrous, nitid, black when dry, yellow, yellow-orange, or yellowish when fresh, 4-seeded, about the size of a small plum or large cherry, edible.

The species has been found both in dry places and in marshes at sea-level, flowering in February and fruiting in July and November. Common names recorded for it are "abisoa", "ada", "adaga", "adefia", "afetewa", "aranga", "bofuluk", "ĕbisaa", "fŏ",

"fő-ti", "fŏ yi", "fŏ yi-ti", "fŏyi-tsho", "God's coconut", "ingari", "ink tree", "kukpweli", "kukui", "lubei", "lugbei", "lugnei", "luwu-wului", "narenga", "nya", "nyamēle-kukwe", "nyarina", "ogikhimi", "okurutu", "orabia", "ore", "ŏrì", "oriri", "ovuruburu", "ŏwenkundigbon", "punyo-tsho", "samanibir", "song-sho", "sŏ-tsho", and "uruahu". "Lugbei" is the name for the plant in the Mende tongue in Sierra Leone. Millen states that a rum, said to be intoxicating, is made from its plum-like fruits, while Deighton reports that "The leaves are dried over a fire and a decoction of them is used as a black ink by the Mohammedans" in the same country.

Chevalier records this plant, misidentified as V. cuneata Schum. & Thonn., from Senegal, French Guinea, and French Soudan. He cites his nos. 15470, 16508, 17107, 17275, 19091, 19790, and 19819 from Ivory Coast. These collections are all cotypes of his V. lutea. Seed of Baldwin 6301 is being grown in cultivation at Williamsburg, Virginia.

Baker cites in addition Rumsey 14, Barter 20180, Millen 32 and 64, and Rowland s.n. from Gold Coast, Barter 2098 from Nigeria, Zenker 839 and 1006 from Cameroons, and Soyaux 215 and Bates 550 from Gabun. Pieper adds Dinklage 1905 from Liberia.

Cotypes of V. bipindensis are Zenker 1351, 1893, 1915, 1915a, and 2164 from Cameroons. According to Pieper, the flower-color difference cited by Gürke as the distinguishing feature between V. grandifolia and V. bipindensis is not dependable. Pieper reduces the latter to varietal rank under V. grandifolia, the variety having its calyxes 3--5 or rarely 6 mm. long, while in the typical form it is only 3--3.5 mm. long. Besides the cotype collections he cites under the variety Zenker 959, Staudt 136, Mildbraed 5658, Tessmann B.193, Ledermann 1135, Buesgen 72a, Zahn 504, Preuss s.n., and Winkler 51a, 118, and 1165, all from the Cameroons. I doubt very much whether the variety is worthy of being retained as distinct.

Citations: SIERRA LEONE: Deighton 2386 (K, N); G. Mann 880 (V). LIBERIA: J. T. Baldwin, Jr., 6301 (N), 6489 (N), 14818 (N). CAMEROONS: Maitland 361 (K, N); Staudt 136 (S); Zenker 959 (S), 1351 (N, N, S), 1893 (N--photo, S, Z--photo), 1915 (S), 1915a (S), 2164 (S), s.n. [Bipindi, May 1897] (N). FRENCH EQUATORIAL AFRICA: Gabun: Klaine s.n. (S). CULTIVATED: Cameroons: Versuchs-anstalt Kamerun 504 (N--photo, Us, Z--photo).

VITEX GRISEA J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 325. 1900.

Synonymy: Vitex huillensis Hiern, Cat. Afr. Pl. Welw. 4: 837. 1900.

Literature: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 325. 1900; Hiern, Cat. Afr. Pl. Welw. 4: 837. 1900; Gürke in Baum, Kunene-Sambesi Exped. 350. 1903; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 48, 61, 82, & 83. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, & 103 (1942)

and [ed. 2], 117, 119, & 201. 1949.

Tree; branchlets densely short-pubescent, the hairs drab; leaves usually 5-foliolate; petioles 5--7.5 cm. long; leaflet-blades subcoriaceous, oblong-cuneate, acute at the apex, entire, subsessile, obscurely pubescent above when mature, finely pubescent throughout beneath, the terminal one 7.5--10 cm. long and 2.5--3 cm. wide at the middle; cymes dense, axillary, short-pedunculate, the peduncle and inflorescence-branches densely pubescent; calyx campanulate, about 2 mm. long, densely pubescent, its rim distinctly dentate with deltoid teeth; corolla small, hairy on the outer surface; fruit not known.

The type of this species is Welwitsch 5759 from an altitude of 3300--5500 feet, Huilla, Angola. Pieper cites, in addition, Munzner 65 from Msamvia, Tanganyika Territory. The specimen cited by Gürke as V. huillensis in the reference given above is actually V. hockii DeWild.

VITEX GRISEA var. DEKINDTIANA (Gürke) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 61. 1928.

Synonymy: Vitex dekindtiana Gürke in Engl., Bot. Jahrb. 32: 143. 1902.

Literature: Gürke in Engl., Bot. Jahrb. 32: 143. 1902; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 61 & 82. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 201. 1949.

This variety differs from the typical form of the species in its shorter internodes, which are very much abbreviated at the tips of the shoots. It appears to represent merely a stunted form in which the leaves have developed more quickly and uniformly, but the stem growth has become retarded. It is doubtful whether it deserves taxonomic recognition. Pieper cites only Dekindt 44 and Antennes 364 from Huilla, Angola.

VITEX GUERKEANA Hiern, Cat. Afr. Pl. Welw. 1 (4): 835. 1900 [not V. guerkeana DeWild., 1909, nor Engl., 1916, nor H. H. W. Pearson, 1928].

Synonymy: Vitex rufescens Gürke in Engl., Bot. Jahrb. 18: 169. 1894 [not V. rufescens A. L. Juss., 1806]. Vitex ferruginea Baker, in part, apud Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58 & 70, in syn. 1928 [not V. ferruginea Schum. & Thonn, 1827].

Literature: Gürke in Engl., Bot. Jahrb. 18: 169. 1894; Hiern, Cat. Afr. Pl. Welw. 1 (4): 835. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 45, 58, 70, 82, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 62. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 201. 1949.

Plant more or less densely pubescent throughout, with light red-brown hairs; leaves 5--7-foliolate; leaflet-blades elongate-obovate, entire, densely pubescent beneath; flowers about 6 mm. long; calyx weakly zygomorphic, to 2.5 mm. long, its teeth 1/5

to 1/4 the length of the calyx, its hairs multicellular, at least at the base; ovary usually densely glanduliferous, glabrous throughout.

A notation on the Kew sheet of Welwitsch 5632 indicates that Baker reduced V. guerkeana Hiern (V. rufescens Gürke) to synonymy under V. ferruginea Schum. & Thonn. only "ex description". Pieper, however, points out that the statement in the original diagnosis to the effect of "foliola utrinque glabra, germen apice pubescens" clearly indicates that there are two distinct species involved. Pieper was able to see authentic material of both species. He cites for V. guerkeana the following collections: Welwitsch 5632, 5654, and 5712, all from Golungo Alto in Angola. Vitex guerkeana DeWild. is a synonym of V. volkensii Gürke, V. guerkeana Engl. is V. payos (Lour.) Merr., and V. gürkeana H. H. W. Pearson is V. pearsonii Pieper.

VITEX GUERKEANA var. GOSSWEILERI Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58. 1928.

Literature: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 58 & 82. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 62. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 201. 1949.

This variety differs from the typical form of the species in having firmer leaf-blades and in having the ultimate branches of the inflorescence and the flowers yellowish.

It is based on Gossweiler 662 from the Cazengo district of Angola.

VITEX GUIANENSIS Moldenke, Alph. List Common Names 14, nom. nud. (1939); Phytologia 1: 486--487. 1941.

Literature: Moldenke, Alph. List Common Names 14. 1939; Moldenke, Geogr. Distrib. Avicenn. 21. 1939; Moldenke, Phytologia 1: 486--487. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 33 & 103. 1942; Moldenke, Phytologia 2: 120. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 67 & 201. 1949.

Tree, to 30 m. tall, slightly buttressed, inclined to be fluted; bark pale-gray, thin, papery; branchlets rather slender, obtusely tetragonal, densely tomentose with rufescent rather short hairs, the tomentum wearing off in age; nodes annulate, flattened; principal internodes 2--6 cm. long; leaf-scars rather large and prominent; leaves deciduous, strongly scented, 5-foliolate; petioles very slender, 4--10 (--18.5 ?) cm. long, densely rufescent-tomentose (in age stout and glabrous ? -- one old petiole, without leaflets, is mounted on an isotype, but may not belong to this species); leaflets thin-chartaceous or submembranous, dark-green above, slightly lighter beneath, unequal, the 2 lowermost mostly considerably smaller than the rest, short-petiolulate; petiolules very slender, 1.5--4 mm. long, densely rufescent-tomentose; central leaflet-blades elliptic, 8.6--15.5 cm. long, 3.1--6.8 cm. wide, acute or short-acuminate at the apex,

entire or obscurely repand-undulate, acute or short-acuminate at the base, sparsely hirsutulous above with scattered ferruginous hairs, very densely so along the midrib and larger veins, somewhat more densely hirsutulous beneath, especially along the larger venation; midrib slender, flat above, prominent beneath; secondaries very slender, 10--15 per side, arcuate-ascending, mostly flat and rather obscure above, prominulous beneath, (indistinctly) anastomosing in many loops at the margins; veinlet reticulation indiscernible above, the larger portions slightly prominulous beneath; inflorescence axillary; cymes abbreviated, much shorter than the petioles; peduncles, pedicels, and young shoots covered with a brown felt of hairs; flowers in erect umbelloid cymes; calyx pale-green, erecto-patent; corolla bilabiate, the upper lip composed of 2 white reflexed lobes, the lower lip composed of 3 blue-purple lobes, with a patch of pale-yellow hairs at the base of the central lobe, reflexed; corolla-tube blue-striate; filaments up to 1/4 longer than the corolla-tube, flushed with purple; anthers blue; fruit not known.

The type of this species was collected in myrtaceous baniaballi bush on the top of Ironstone Hill where there was no uniform soil covering, but only soil pockets, in British Guiana (British Guiana Forest Dept. 2543) on October 28, 1937, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The native Arawak name is "hakiaballi".

Citations: BRITISH GUIANA: British Guiana Forest Dept. 2543 [field no. 9] (K--type, K--isotype, N--isotype, N--photo of type, Z--photo of type).

VITEX HARVEYANA H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212--213. 1901.

Synonymy: Vitex schlechteri Gürke in Engl., Bot. Jahrb. 33: 299. 1904.

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212--213. 1901; Gürke in Engl., Bot. Jahrb. 33: 299. 1904; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 56, 82, & 84. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 51, 52, 103, & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 63 & 81. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 120, 122, 201, & 202. 1949.

Woody bush or shrub, 2--2.7 m. tall; internodes elongate; branches tetragonal, striate, appressed-puberulent or appressed-pubescent when young, especially at the nodes; leaves decussate-opposite, 3--5-foliolate; petioles slender, 8--25 mm. long; leaflet-blades subcoriaceous, obovate, subsessile or short-petiolate, 3.2--5.2 cm. long, 1.3--2 cm. wide, varying from acute or acuminate to obtuse or rounded at the apex, cuneate at the base, entire or 1--7-serrate on each side above the middle, glabrous on both surfaces except for tufts of hairs in the vein-axils beneath, minutely glandular, the lateral ones often much smaller; petiolules obsolete or to 7 mm. long, grooved; secondaries 5--8 per side, obscure above, prominent beneath; cymes pedunculate, axillary, loosely divaricate, few-flowered, usually exceeding

the subtending leaves, bracteate, pubescent at the nodes, otherwise appressed-puberulent or glabrous; peduncles flattened, 2.5--4.5 cm. long, puberulent; bractlets subulate or narrow-spatulate, 3--9 mm. long, puberulent or glabrous; pedicels short, 2-bracteolate; calyx cupuliform, 2.5--3.5 mm. long, 10-nerved, glabrous within, pubescent and minutely glandular outside, its rim subtruncate or very slightly 5-toothed; corolla pale-blue, its tube slightly curvate, 6--8 mm. long, glabrous within, pubescent outside above the middle, glabrous below the middle, its limb ultimately reflexed, the anterior lip pubescent within at the base, minutely so outside; stamens inserted at about the middle of the corolla-tube, included; filaments ampliate and villous at the base; ovary subglobose, glabrous; fruit drupaceous, spherical or suboblong, dar exserted from the slightly accrescent fruiting-calyx, glabrous, about 8 mm. in diameter, with a thick woody endocarp.

The species is based on Gerard & McKen 1250 from the banks of the Upper Tugela River, Natal, and Haygarth s.n. [Wood 7462] from an altitude of 100 feet in Zululand. The type of V. schlechteri is Schlechter 11731 from Komati Poort in Transvaal.

Meeuse, in a letter to me dated December 9, 1953, states that he feels that V. geminata H. H. W. Pearson, V. mombassae Vatke (including V. flavescens Rolfe and V. goetzei Gürke), V. pooara Corbishley, and possibly V. isotjensis Gibbs belong in the synonymy of V. harveyana. He bases this conclusion on examinations by an associate of the isotypes at Kew and by comparison of notes and specimens with Dr. H. Wild in Salisbury, Southern Rhodesia. Pieper, however, not only keeps these apart, but also keep apart V. harveyana and V. schlechteri. He says that the former has 3-foliolate leaves, petioles mostly only to 2 cm. long, and pedicels to 6 mm. long, while the latter has 5-foliolate leaves, petioles 2--2.5 cm. long, and pedicels 6--10 mm. long. He notes that V. wilmsii Gürke, said to be a close relative, has only superficial habital likenesses and actually belongs in the subgenus Holmskioldiopsis.

V. harveyana is said to grow in low velt bush in dry watercourses, at altitudes of 100 to 1100 feet. It has been collected in flower in May and in fruit in April.

Citations: PORTUGUESE EAST AFRICA: Lourenço Marques: Borle 157 (Af, N--photo, Z--photo). UNION OF SOUTH AFRICA: Natal: Gerstner s.n.(Na--22252); Haygarth s.n. [Wood 7462] (N--cotype, N--photo of cotype, Na--3620--cotype, S--photo of cotype, Z--photo of cotype). Transvaal: Codd 5514 (Z); Rodin 4232 (N, S); F. A. Rogers 13278 (Na--15691); Schlechter 11731 (N, N--photo, S, Z--photo).

VITEX HAUSKNECHTII Bornm., Beih. Bot. Centralbl. 22 (2): 118. 1907.

Synonymy: Vitex agnus castus var. micrantha Hausskn. ex Bornm., Beih. Bot. Centralbl. 22 (2): 118, in syn. 1907. Vitex haussknechtii Bornm., Notizbl. Bot. Gart. Berlin 7: 25. 1917.

Literature: Borrm., Beih. Bot. Centralbl. 22 (2): 118. 1907; Prain, Ind. Kew. Suppl. 4: 248. 1913; Borrm., Notizbl. Bot. Gart. Berlin 7: 25. 1917; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 103. 1942; Moldenke, Alph. List Invalid Names Suppl. 1: 28. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 124 & 201. 1949.

Borrmüller originally published this name as a binomial, but called it "subspec. nov." and referred to it as an "Unterart". In the Notizblatt reference, cited above, the original citation is written, in error, as having appeared in volume 20 of the Beihefte, instead of volume 22.

The species differs from the typical V. agnus-castus L., of which it is said to be a subspecies, in having its flowers very small, measuring only 5 mm. from the base of the calyx to the anthers (or only half as long as in typical V. agnus-castus), the corolla-tube is only twice (instead of thrice) the length of the 1.5 mm. long calyx, the spikes are slender, thin, short, all congested at the apex of the branches into a many- [8- or 9-] branched, ovate, subaphyllous panicle which is 10--12 cm. long and 5--6 cm. wide, and the cymes are small and laxly flowered. Otherwise its characters are those of V. agnus-castus.

The type of the species is Haussknecht s.n., collected at Marasch, near Dschihan Köprü, Syria, on July 12, 1865. It is known thus far only from the type collection.

VITEX HAVILANDII Ridl., Kew Bull. 1929: 262. 1929.

Literature: Ridl., Kew Bull. 1929: 262. 1929; Hill, Ind. Kew. Suppl. 8: 249. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 65 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 145, 146, & 201. 1949.

Small tree; branchlets puberulent; leaves 1-foliolate; petioles 1.5--2 cm. long, incrassate at the apex; leaflet-blades coriaceous, lanceolate, 8--11 cm. long, 3--5 cm. wide, obtuse at the base, cuspidate at the apex, with the cusp 1--1.5 cm. long; midrib prominent on both surfaces; secondaries about 9 per side, inwardly arched about 2 mm. from the margins, prominent beneath; vein and veinlet reticulation conspicuous; panicle lax, few-flowered, located in the upper leaf-axils, 5--8 cm. long, puberulent, its branches 1--3 cm. long; flowers small, 2 or 3 on each short branch; pedicels about 1 mm. long; bractlets linear, about 1 mm. long, acuminate; calyx cupuliform, about 2 mm. long, its rim 5-toothed, the teeth very short, acute or subacute; corolla about 6 mm. long, its tube glabrous at the base, pubescent above, its 4 lobes oblong and obtuse, the labellum rounded and entire; ovary globose, sunken in the calyx.

The species is based on Haviland 861 and is reported also from Sarawak. It is said to be a tree 30 feet tall, with white flowers, blooming in August, growing at an altitude of 15 meters in British North Borneo.

Citations: BRITISH NORTH BORNEO: Agama 575 [128] (N--photo,

Ph, Z--photo).

VITEX HAYNGA Roxb., Hort. Beng. 46, hyponym. 1814.

Literature: Roxb.., Hort. Beng. 46. 1814; Jacks., Ind. Kew. 2: 1213, 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55 & 103 (1942) and [ed. 2], 128 & 201. 1949.

I know nothing about this species except that Roxburgh says that it grows in the Chittagong area of West Bengal, where it is known as "haynga".

VITEX HEMSLEYI Briq., Bull. Herb. Boiss. 4: 347. 1896.

Synonymy: Cornutia pentaphylla Sessé & Moc., La Naturaleza, ser. 2, 1: app. 103. 1889 [not C. pentaphylla Pavon, 1936, nor Vitex pentaphylla Merr., 1909]. Vitex capulin Pittier, Contrib. U. S. Nat. Herb. 20: 485--486. 1922. Vitex leucoxilon Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 51, in syn. 1940 [not V. leucoxylon L. f., 1781]. Vitex oaxacona Briq. ex Moldenke, Suppl. List Invalid Names 11, in syn. 1941. Vitex oaxacana Briq. ex Moldenke, Alph. List Invalid Names 54, in syn. 1942.

Literature: Sessé & Moc., La Naturaleza, ser. 2, 1: app. 103. 1889; Briq., Bull. Herb. Boiss. 4: 347. 1896; Merr., Philipp. Journ. Sci. Bot. 4: 320. 1909; Pittier, Contrib. U. S. Nat. Herb. 20: 485--486. 1922; Moldenke, Alph. List Common Names 7. 1939; Moldenke, Geogr, Distrib. Avicenn. 14. 1939; Moldenke, Prelim. Alph. List Invalid Names 23, 50, & 51. 1940; Moldenke, Suppl. List Invalid Names 11. 1941; Moldenke, Alph. List Invalid Names 22 & 52--54. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 103. 1942; Moldenke, Phytologia 2: 120. 1944; W. C. Leavenworth, Am. Midl. Nat. 36: 146, 147, & 187. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 201. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mexico 20: 15. 1949.

Tree, to 12 m. tall; branches and branchlets slender, obtusely tetragonal, prominently lenticellate, more or less puberulent, becoming glabrate in age; nodes annulate; principal internodes 6--12 mm. long; leaf-scars very large, with prominent edges, not borne on noticeable sterigmata; leaves decussate-opposite, 5-foliolate; petioles slender, 1.5--4.5 cm. long, flattened above and only very slightly margined, not canaliculate, convex beneath, puberulent; petiolules slender, 1--5 mm. long, broadly margined, sparsely puberulent; leaflet-blades chartaceous, rather uniformly dark-green on both surfaces or slightly lighter beneath, the terminal one elliptic, 4--13.2 cm. long, 1.2--4.6 cm. wide, acute or obtuse at the apex, entire, acute at the base, very sparsely and obscurely pulverulent along the larger venation or glabrous and shiny on both surfaces; midrib slender, slightly prominulent or subimpressed above, rounded-prominent beneath; secondaries slender, 10--14 per side, arcuate-ascending, rather short, plane or obscure above, subprominulent beneath, rather indistinctly arcuate-joined near the margins.